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ABSTRACT

The general aim of this guide is to aid the teachers of the fifth and sixth grade boys and girls who participate in the Outdoor School program at the Battle Creek Outdoor Center. Another major aim of this guide is to aid the outdoor school teachers who bear the major responsibility in implementing the outdoor school program. An historical overview of the Clear Lake Camp in Michigan, a description of the outdoor center facility, an overview of the Outdoor School program, staff responsibilities at the Outdoor School, planning information for teachers, instructions on how to use the guide, and a sample weekly schedule are given. Activities for education for the out-of-doors and activities for education in the out-of-doors are described in separate sections for fall, winter, and spring. A rationale, the recommended grade level, background information for teachers, the seasonal implication, and a descriptive outline are given for each activity. Specific activities include archery; gun safety; fishing; boating; arts and crafts using native materials; cooking out; orienteering on a compass course; visits to a dairy farm, a beef farm, and a sphagnum bog; a fossil dig; a rock hunt; a drop-off hike; an exploration of the Cedar Creek Watershed, and an observation of pond life. (HBC)

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A TEACHERS' GUIDE FOR THE OUTDOOR SCHOOL PROGRAM

[1970]

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FOREWARD

Outdoor Education and the Battle Creek Public Schools

Outdoor education in the Battle Creek Public Schools is based on the premise that all children should be exposed to the out-of-doors in a school setting to develop an initial awareness leading to a reasonable understanding of man's ultimate dependence upon his natural environment.

Outdoor education in Battle Creek is an attempt to educate children "IN and FOR" the out-of-doors.

The "IN" phrase means we are using the outdoor portion of the real world to provide an experience base for children who will be exposed to outdoor-related ideas, as abstractions developed primarily with written words and pictures in the classroom. We feel the child will be better able to form concepts in this area of expected learning if he has had the appropriate direct experience with the real outdoor world.

These direct experiences are particularly important in areas like plant biology, soil science, horticulture, animal husbandry, geography and ecology. Learning in mathematics, art, communications, and other academic areas, as well, can be enhanced and broadened by complementary outdoor activities. The potential complementarity of outdoor experience becomes more apparent when the phrase "outdoor education" is changed to "environmental education" which suggests using the total environment around the child as a learning laboratory.

The "FOR" phrase means we use outdoor education to orient children to using the out of doors for its recreational, aesthetic, and economic values.

For example, helping children develop skills in archery, swimming, hiking, casting, hunter safety, firebuilding, rowing, and canoeing, contributes to their ability to use their leisure time as adults in a healthy constructive manner.

In addition to more academic and skill-oriented aspects of learning, the outdoor experience, particularly the Outdoor School program, offers children an experience in living together 24 hours a day with each other and their teachers. We feel this experience contributes materially to the social growth of individuals as they experience the responsibilities and interactions in a group living together as a social unit.

The Battle Creek Public Schools' commitment to outdoor education is exemplified by three major programs operating at the Outdoor Education Center at Clear Lake. When considered sequentially, the Barnyard program, the Farm and Garden program, and the Outdoor School program involve children at five grade levels out of seven at the elementary school level.

The unique educational experience offered Battle Creek boys and girls represents only the beginning of educating for "environmental awareness", an awareness that will become increasingly tied to man's ability to provide a quality existence on this planet for this generation and generations to come.

Larry McKown, Consultant in Science
and Director of Outdoor Education

Battle Creek Public Schools
Battle Creek, Michigan

TABLE OF CONTENTS

	PAGE
Foreward	ii
Preface	vii
Clear Lake Camp, An historical Overview	1
The Outdoor Center Facility	2
An Overview Of The Outdoor School Program	3
Staff Responsibilities At The Outdoor School	6
Planning Information For Teachers	9
Monday Schedule	10
Tuesday-Thursday Schedule	11
Friday Schedule	12
How To Use This Guide	13
Fall - Education For The Out-of-Doors	
Archery	F-1
Gun Safety And Introductory Marksmanship	F-3
Fishing In Clear Lake	F-6
Boating	F-9
Arts And Crafts Using Native Materials	F-12
Cooking Out	F-14
Orienteering On A Compass Course	F-16
Fall - Education In The Out-of-Doors	
Visit To A Dairy Farm	F-18
Visit To A Beef Farm	F-21
Prehistoric Life In Michigan - A Fossil Dig In Barry County	F-23
Visit To A Sphagnum Bog	F-29

PAGE

Understanding Our Environment -
The "Grand Canyon" Of Barry County F-34

Observing Pond Life In The Fall-
The Food Chain F-43

Winter - Education For The Out-of-Doors

Gun Safety And Introductory Marksmanship W-1

Ice Fishing On Clear Lake W-4

Arts And Crafts Using Native Materials W-7

Cooking Out W-9

Winter - Education In The Out-of-Doors

Visit To A Dairy Farm W-11

Visit To A Beef Farm W-14

Prehistoric Life In Michigan -
A Fossil Dig In Barry County W-16

Discovering Michigan Rocks W-22

Drop-off Hike W-28

Animal Tracking In Winter W-37

Winter Lake Exploration W-47

Understanding Our Environment -
Exploring In The Cedar Creek Watershed . . . W-52

Winter Pond Life -
"Probing For Plankton" W-67

Spring - Education For The Out-of-Doors

Archery S-1

Gun Safety And Introductory Marksmanship S-3

Fishing In Clear Lake S-6

Boating S-9

Arts And Crafts Using Native Materials S-12

PAGE

Cooking Out S-14

Orienteering On A Compass Course S-16

Spring - Education In The Out-of-Doors

Visit To A Dairy Farm S-18

Visit To A Beef Farm S-21

Prehistoric Life In Michigan -
A Fossil Dig In Barry County S-23

Discovering Michigan Rocks S-29

Drop-off Hike S-35

Understanding Our Environment -
Exploring In The Cedar Creek Watershed . . . S-44

Understanding Our Environment -
The "Grand Canyon" Of Barry County S-61

Observing Pond Life In The Spring -
Plankton And The Food Chain S-70

Appendix

Registration and Health Blank

Information For Parents - Outdoor School Program

Equipment and Clothing Suggestions

What-To-Take Check List

A Final Letter To Parents

Outdoor School - Teacher Planning Sheet - Fall

Outdoor School - Teacher Planning Sheet - Winter

Outdoor School - Teacher Planning Sheet - Spring

Class Enrollment Sheet

PREFACE

Our children are now living in an age of technology dominated by pushbutton mechanization and automation. As a result man now appears to have more leisure time to spend than at any point in our history. Whereas in the beginning man was highly dependent upon the natural world for his mere existence, man is also now discovering his dependence upon the natural world for its recreational and aestetic values in our leisure pursuit of time.

The 1970's have already been characterized as a decade of great national concern about our environment. After nearly a century of slowly depleting our natural resources and polluting the environment with little regard for our future needs, we are now vitally concerned about fully understanding our relationship to the natural world and our ultimate dependence upon the land as we plan for our future existence.

Our young people are anxious to be informed of environmental problems and to be better prepared when they become involved in solving them. As a result there is a great need for our youth to be taught to use wisely the land and natural resources that remain.

The Outdoor School program is designed to supplement those learnings that occur in the classroom by providing a variety of experiences in the real world that make outdoor or environmental education relevant to youth. In focusing on education "in" the out-of-doors the program is designed to involve the students in a series of direct, first hand experiences that will acquaint them with many of the natural areas (bog, pond, fields, forest, gully, lake, etc.) that exist, their natural history, the natural resources they provide, and man's relationship to these areas. Emphasis is placed on understanding the need for wise use of these areas. In focusing on education "for" the out-of-doors the program is designed to introduce children to a variety of outdoor activities, mostly skill oriented, that will encourage them to effectively utilize the out-of-doors for their recreational pursuits and constructive use of free time. In addition, living in the camp community 24 hours a day provides children with many social experiences as they interact with their peers. Thus, the Outdoor School program also serves as a vehicle for improving human relationships.

The general aim of this guide is to aid the teachers of the fifth and sixth grade boys and girls who participate in the Outdoor School program at the Battle Creek Outdoor Center. Specifically, it provides each classroom teacher with a rationale and background for each of the many outdoor activities in which the children may participate as well as providing adequate background information concerning the structure of the total program.

Since careful planning by the classroom teacher is necessary to make the outdoor school program an educational experience of importance, this resource guide has been designed to provide the necessary information to enable the teacher to better plan and prepare for the experience as well as participate effectively in the program.

Another major aim of this guide is to aid the outdoor school teachers who bear the major responsibility in implementing the outdoor school program. The detailed descriptions of the various experiences in which children participate are intended to serve as a guide for the outdoor school teacher in organizing the instructional program.

The organization and content of the Outdoor School program is the result of the combined efforts and thinking of the entire teaching staff of the Outdoor School. Appreciation is also expressed to the many classroom teachers who by offering suggestions have contributed greatly to the development of this guide.

Jack N. Wykoff, Director
Outdoor Education Center

Battle Creek Public Schools
Battle Creek, Michigan

CLEAR LAKE CAMP, AN HISTORICAL OVERVIEW

The origins of the Battle Creek Public Schools' Outdoor Education Center are closely connected with those of the Kellogg Foundation. The W. K. Kellogg Foundation was established in 1930 to promote better health for children, and camps were soon initiated, in southern Michigan, for that purpose. In 1932 facilities at Pine Lake were used for summer camping for children. In 1933 the Foundation program expanded into winter camping. The Clear Lake Camp site was acquired from the Campfire Girls of Battle Creek. The Foundation added to the land, constructed a main lodge similar to Pine Lake's, and began using the camp during the winter months. In 1937 the foundation began to use a third camp, St. Mary's Lake, for winter camping.

Favorable results of the earlier welfare camp efforts along with the growing concern of educators about the whole-child development, prompted the Kellogg Foundation in 1940 to propose another experiment in educational camping. Public school people in Michigan were invited to participate in demonstrating the effectiveness of community and school programs. Thus, the first public school camp was initiated on an experimental basis at Clear Lake in 1940-41.

The outdoor education experiment was interrupted by World War II, when the camp at Clear Lake was used by the U.S. Coast Guard for training purposes from 1942 to 1945.

Following the War, the Battle Creek Public Schools and near-by districts expanded their activity in school camping; and, of the three original camps involved, Clear Lake eventually became the setting where all of the school camping activity took place.

In 1947, the Battle Creek Public Schools assumed the major responsibility for operating the Clear Lake Camp. In 1957, the Kellogg Foundation deeded the property and facilities to the Battle Creek Public Schools to continue the now well-established program in outdoor education. At this time the main lodge was renovated, and the two dormitories were constructed.

In 1966, the name Clear Lake Camp was changed to Battle Creek Public Schools Outdoor Education Center. However, although the camp is now a part of a larger outdoor education complex, the camp site and its immediate area are still referred to as Clear Lake Camp. Also, at this time the school camping program became known as the Outdoor School Program.

In 1967, the School Farm and Garden Program was transferred from its Battle Creek location and joined the Outdoor School Program as a second major program operating on the newly expanded Outdoor Education Center site.

THE OUTDOOR CENTER FACILITY

The Outdoor Education Center is completely owned and operated by the Battle Creek Public Schools. The outdoor site has expanded from the original 35 acre camp site on the shores of Clear Lake to a more comprehensive 140 acre site which contains varied natural habitats including rolling grasslands, a mature oak-hickory hardwood forest, a lakeshore, a pond area, and other smaller habitats typical of southern Michigan.

Located on Clear Lake in Barry County, the Center is entered from state highway 37 approximately 13 miles northwest of the city of Battle Creek.

The outdoor site has a full complement of buildings and other facilities designed to enhance the outdoor instructional program. The physical facilities and program resources include:

MAIN LODGE: kitchen, dining hall, lounge, offices, meeting rooms, instructional materials center, camp store, nature craft shop, and eight private bedrooms for use by outdoor school teachers and classroom teachers.

BUNKHOUSES: three rooms in each of the two bunk houses providing sleeping space for 67 boys and 67 girls. On the second floor of each building there is a room and bath for ten college students.

CLASSROOM BUILDING: contains three modern classrooms equipped with lab style furniture which is used for planning activities and providing enrichment and laboratory experiences for children.

BARN: houses a small collection of typical farm animals and fowl which children may care for.

Also located on the camp grounds are fishing areas, boat docks housing a fleet of 10 rowboats, an archery range, an air rifle range, and a lumbering area.

AN OVERVIEW OF THE OUTDOOR SCHOOL PROGRAM

The Outdoor School program is a thirty four week operation that begins in mid-September and ends in mid-June. The school is in session each week except during established vacation periods.

Each week throughout the school year an average of 100 boys and girls participate in this outdoor program and live together in the camp setting. The students arrive on Monday morning and depart on Friday afternoon.

The Outdoor School program is an established part of the elementary curriculum of the Battle Creek Public Schools. The overall program is subdivided into two phases, the fifth grade program and the sixth grade program. The fifth grade program occurs during the winter season (December, January, February), and each fifth grade class is assigned one week during that time block for their participation. The sixth grade program occurs during the fall season (September, October, November), and each sixth grade class is assigned one week during that time block for their participation. Thus, each child in the Battle Creek school district has two separate experiences in residence at Clear Lake during two different seasons.

The instructional program is semi-structured. Most of the activities are required at a specific grade level; hence, there is a specific grade five program and a grade six program. The required activities are primarily those that have been most popular with students in the past or those that have been developed to be performed in sequence. The two year sequential program also eliminates redundancy by limiting the repetition of the same activities by students in two successive years. However, there are optional activities at each grade level from which additional activities are chosen by each class to round out their program. For a complete listing of the activities in the grade five program please refer to page 15; the listing of the activities in the grade six program is found on page 16.

About one half of the school year is designated for use by the fifth and sixth grade students in the Battle Creek district. During the remaining portion of the year students in fifth or sixth grade classes in other Michigan school districts come to the Outdoor School. Most of these classes come in the spring season (March, April, May, June); a few classes come during the fall or winter seasons.

The instructional program for out of district students varies depending upon the season in which the students are participating. Since out-of-district students come to the Outdoor School only one time and are able to participate in

less than half of the instructional activities offered at the Outdoor School, the program is flexible. It is planned primarily by the students and their teacher and is geared to the season in which they are participating.

While at the Outdoor School the children work together in their classroom groups. There are usually four classes in camp. The classroom teacher participates actively in the program and remains with her class the entire week.

An outdoor school teacher is assigned to work with each classroom group. This teacher visits the class several weeks in advance of their visit to the Outdoor School and provides a complete orientation to the program for both the students and their teacher. The same teacher is then responsible for implementing the instructional program with the class during the week of residency at the Outdoor School.

The children sleep in winterized bunkhouses and eat in a modern camp-type dining facility. Instructional planning and activities occur both on the Outdoor Center site and at selected outdoor instructional areas nearby. The students have seven or eight instructional periods during the week in addition to special evening activities that are more recreational in nature as well as assigned daily responsibilities to help keep the Outdoor School functioning with respect to meals and general tidiness of the living area. The entire camp eats together in the lodge dining hall. Balanced meals prepared by experienced cooks are served family style. Using the host system, students are expected to exhibit high standards of etiquette and table manners. Each class does their share of table setting and cleanup in the dining room. Students are assigned seats at the tables to provide more opportunity to meet new friends.

The resident Outdoor School instructional staff is composed of five certified teachers. One of these teachers functions on a full time basis as a general coordinator of activities to keep the mechanics of the program operating smoothly, since facilities and resources are shared by four different classroom groups. Members of the teaching staff are usually younger teachers representing a broad background of academic training as a group. Many have had experiences with children in outdoor programs prior to coming to the Outdoor Education Center. The teachers are supported by a full-time director, responsible for the operation of the entire Center, and teaching assistants who have student teacher or college intern status.

The Battle Creek school district provides and maintains the capital facilities for operating the program. The Board of Education also provides funds for implementing the instructional program including the salaries of the instructional staff. Each Battle Creek student is assessed a fee to cover the cost of food, maintenance, and related expenses of operation.

Students who attend the program from other participating school districts are assessed a separate fee which is proportionate to the total cost of operation.

Classroom groups are encouraged to raise funds in a variety of ways to help reduce the total cost of camp fees.

Funds are available to pay fees for needy children. No child is denied the opportunity to participate in the Outdoor School program due to a lack of funds.

STAFF RESPONSIBILITIES AT THE OUTDOOR SCHOOL

A. The DIRECTOR is responsible to the Board of Education for the overall health, welfare, and education of every participant at the Outdoor School site. He implements the policy and philosophy of the Outdoor School Program and is responsible for the successful operation of the program. He also is responsible for the operation of all physical maintenance, and medical personnel.

B. The OUTDOOR SCHOOL TEACHER serves primarily as a resource teacher who is skillful in providing leadership in the many and varied activities which are pursued at the Outdoor School. He must also be familiar with and able to implement the organizational structure and daily routine of the Outdoor School.

The outdoor teacher does not have a continuing responsibility for the educational growth and development of a group of children but does have a primary responsibility to work cooperatively with the classroom teacher to develop appropriate organization during the week at Clear Lake to incorporate and implement the planned activities, thereby meeting the objectives of the classroom teacher and her students.

More specifically it is recommended that the outdoor school teacher become involved in the resident outdoor education program as follows:

1. The outdoor school teacher should have an opportunity to review the OUTDOOR SCHOOL PLANNING SHEET developed by the classroom teacher prior to coming to Clear Lake, and plan accordingly.

2. The outdoor school teacher sets up the initial organization for the classroom group, classroom teacher, and teaching aides upon the arrival of the children on Monday morning.

3. The outdoor school teacher provides the organizational leadership for routine daily living and learning activities--meals, bedtime, lazy hour, bus transportation, trips, instructional materials, cookouts, etc.

4. The outdoor school teacher reviews the classroom group's purposes for coming to the outdoor school, with students, classroom teachers and aides, and develops a week long organizational pattern for providing the kinds of experiences desired.

5. The outdoor school teacher implements the organizational plan developed with the group and works cooperatively with the classroom teacher to involve all associated adults in roles appropriate to their ability and responsibility.

6. The outdoor school teacher assumes bunkhouse "put-to-bed" duties on a rotational basis in proportion to the classroom teacher's recommended bunkhouse responsibilities (maximum of two per week).

7. The outdoor school teacher has the primary responsibility for organizing and conducting the evening programs - some of which might be pre-planned in the classroom and some that are developed at Clear Lake.

C. The CLASSROOM TEACHER retains the same responsibility for the welfare of her students at the Outdoor School as she does in the classroom. She plays a major role in affecting the success of the week of residency in the camp setting. She carries the primary responsibility for the educational growth and development of the children before they go to Clear Lake and after they leave. It follows that the classroom teacher cannot relinquish this responsibility to the outdoor school teacher assigned to her group; therefore, she must logically combine forces with the outdoor teacher so that both become functional members of a leadership team, each giving of their own special talents to provide the best possible experiences for the boys and girls.

More specifically (with proper orientation and guidance), it is recommended that the classroom teacher become involved in the outdoor education program as follows:

1. The classroom teacher develops a general outline of experiences and learnings she would like her children to be exposed to at Clear Lake.

2. The classroom teacher helps the children develop some specific purposes and concerns about what they will do and learn in an outdoor setting prior to their week at Clear Lake.

3. The classroom teacher provides on-the-spot guidance for the outdoor school teacher's day by day organization of activities at Clear Lake so the major outdoor education objectives, as pre-planned by the classroom teacher, will be met.

4. The classroom teacher plays a functional role in all activities at a level appropriate to her knowledge of children, the organizational structure of the group, the special contribution learning in an outdoor setting can make to the development of the intellectual processes of children through observation and inquiry, and her knowledge of the out-of-doors.

5. The classroom teacher retains a leadership role in maintaining the behavioral expectations demanded of students in the classroom. This responsibility cannot be delegated at any time. The classroom teacher must provide strong support for the outdoor school teacher working with her group.

6. The classroom teacher in remaining responsible for the discipline and conduct of her students should work closely with members of the Outdoor School staff to ensure that the social living phase of the total experience will be most meaningful for each student.

7. The classroom teacher assumes bunkhouse "put-to-bed" duties on a rotational basis in proportion to the outdoor school staff's bunkhouse responsibilities (maximum of two nights per week).

8. Realizing that some additional time must be given to provide this unique educational opportunity for children, it is hoped that the classroom teacher will anticipate the need to clear her normal after school commitments during the week of visitation so she will be able to give the needed leadership and support to her children and the outdoor school teacher.

(certain obligations that COULD NOT be rescheduled, omitted, modified, or substituted should be discussed with the building principal who would discuss the problem with the Outdoor Education Center Director, and work out a solution.)

D. The CAMP NURSE is responsible for the health, safety, and medical care of all participants at the Outdoor School. She works with the director and the coordinating teacher in developing a good camp health program. Specifically, she renders first aid, administers medications, provides adequate nursing care, and works cooperatively with the total staff in developing a team approach to all matters of health and safety.

PLANNING INFORMATION FOR TEACHERS

The following can be used as a check list as you plan for and prepare your students for the Outdoor School experience.

____ Check with your principal early in the school year to determine which week you will be going to the Outdoor School.

____ Inform your students of the date well in advance of the trip.

____ If your children are going to participate in money making projects to earn part of their camp fees, organize plans with the students early in the school year.

____ Make plans to utilize the Outdoor School experience to further your classroom instructional program.

____ Review the Teachers' Guide in preparation for discussing the program with the students.

____ Discuss with students and send home the Registration and Health Blank and the parents' letter at least three full weeks before the week of participation (see Appendix).

____ Discuss with students and send home the "Suggested Clothing and Equipment List" and "What To Take Checklist" (see Appendix). Encourage the students to place the later list in their suitcase to use at camp.

____ Prepare an alphabetical list of students who are going to the Outdoor School. Use the form provided by the Outdoor School. (see Appendix)

____ Prepare a list of students that need financial aid and discuss it with the principal.

____ Review with the students their various social responsibilities while attending the Outdoor School emphasizing table manners and living together in the bunkhouses.

____ Discuss with students the bus trip to camp.

____ Remind students that their name and school should be on every piece of gear they take to the Outdoor School and that their name should be on every piece of clothing.

____ Remember to take the Registration and Health Blanks and your Class List with you on Monday to give to the nurse.

MONDAY SCHEDULE

8:00	Staff breakfast
8:45	Staff organizational meeting
9:30	Campers arrive Orientation meeting
11:30	Make up beds
11:30	Table setters report for lunch duty
12:00	Lunch
1:00	Activity period (end about 5:00)
4:30	Rest hour (optional)
5:00	Table setters report for duty
5:30	Supper
6:30	First evening program
7:15	Second evening program
8:15	Ready for bed
8:45	Lights out, story
9:30	Quiet

TUESDAY - THURSDAY SCHEDULE

7:15	Reveille
7:30	Table setters report for breakfast duty Weather crew reports
8:00	Breakfast
8:30	Morning weather report
8:40	Flag raising
8:45	Dorm cleanup
9:15	Activity period (end about 11:45)
11:30	Table setters report for lunch duty
12:00	Lunch
1:00	Activity period (end about 4:00)
4:15	Rest hour
5:00	Table setters report for supper duty Weather crew reports
5:30	Supper
6:20	Evening weather report
6:30	First evening program
7:15	Second evening program
8:15	Ready for bed
8:45	Lights out, story
9:30	Quiet

FRIDAY SCHEDULE

6:45	Reveille Pack Up Dormitory cleanup
7:30	Table setters report for breakfast duty
8:00	Breakfast
8:30	Morning weather report
8:40	Lost and found claim
8:45	Activity period (end about 11:30)
11:30	Table setters report for lunch duty
12:00	Lunch
12:45	Camp cleanup Load luggage
1:30	Campers depart

How To Use This Guide

A. SEASONAL IMPLICATION

The Outdoor School activities are organized to coincide with the three major climatic seasons that occur during the school year. The seasons are identified as follows;

Fall	September, October, November
Winter	December, January, February
Spring	March, April, May, June

For easy reference:

1. All activities in the Outdoor School Program occurring during the Fall season are found in the YELLOW section of this guide (section F).
2. All activities in the Outdoor School Program occurring during the WINTER season are found in the BLUE section of this guide (section W).
3. All activities in the Outdoor School Program occurring during the SPRING season are found in the GREEN section of this guide (Section S).

B. AVAILABLE PROGRAMS FOR STUDENTS

Recognizing that students in the Battle Creek school district participate in the Outdoor School Program for two consecutive years the following format has been established for their program:

1. Grade five students attend only during the winter season and participate in a program designed specifically for their grade level.
2. Grade six students attend only during the fall season and participate in a program designed specifically for their grade level.

Students from schools not in the Battle Creek district participate in the Outdoor School Program only once. It is recommended that the program for those non-district students participating in the fall or winter season be patterned after the seasonal program which exists for Battle Creek students. Students participating during the

spring season are afforded the opportunity to develop their program by means of teacher-pupil planning in the classroom.

For easy reference:

1. The program outline for Battle Creek grade five students appears on page 15.
2.
2. The program outline for Battle Creek grade six students appears on page 16.

3. The program outline for non-Battle Creek district students participating during the fall season appears on page 17.

4. The program outline for non-Battle Creek district students participating during the winter season appears on page 18.

5. The program outline for non-Battle Creek district students participating during the spring season appears on page 19.

BATTLE CREEK PUBLIC SCHOOLS
Battle Creek, Michigan

Division of Instruction

ESTABLISHED GRADE 5 OUTDOOR SCHOOL PROGRAM-WINTER (DECEMBER-FEBRUARY)

A. Education For The Out-of-Doors

1. Cooking out

2. _____
(optional activity to be chosen from list below)

B. Education In The Out-of-Doors

1. Discovering Michigan Rocks

2. Drop-off Hike

3. Winter Pond Life
"Probing For Plankton"

4. Understanding Our Environment -
Exploring In The Cedar Creek Watershed

5. Visit To A Dairy Farm

6. _____
(optional activity to be chosen from list below)

OPTIONAL ACTIVITIES

A. Education For the Out-of-Doors

1. Arts & Crafts Using Native Materials
2. Ice Fishing on Clear Lake

B. Education In The Out-of-Doors

1. Animal Tracking In Winter
2. Winter Lake Exploration

BATTLE CREEK PUBLIC SCHOOLS
Battle Creek, Michigan

Division of Instruction

ESTABLISHED GRADE 6 OUTDOOR SCHOOL PROGRAM - FALL (SEPTEMBER-NOVEMBER)

A. Education For The Out-of-Doors

1. Boating
2. Gun Safety and Introductory Marksmanship
3. _____
(optional activity to be chosen from list below)
4. _____
(optional activity to be chosen from list below)

B. Education In The Out-of-Doors

1. Prehistoric Life In Michigan -
A Fossil Dig In Barry County
2. Understanding Our Environment -
A Visit To A Sphagnum Bog
3. Observing Pond Life In The Fall -
The Food Chain
4. Understanding Our Environment -
The "Grand Canyon" of Barry County
5. Visit To A Beef Farm

OPTIONAL ACTIVITIES

A. Education For the Out-of-Doors

1. Archery
2. Arts & Crafts Using Native Materials
3. Cooking Out
4. Fishing In Clear Lake
5. Orienteering On A Compass Course

OUTDOOR EDUCATION CENTER
BATTLE CREEK PUBLIC SCHOOLS

RECOMMENDED FALL OUDOOR SCHOOL PROGRAM FOR NON-BATTLE CREEK DISTRICT STUDENTS

A. Education For The Out-of-Doors

1. Boating
2. _____
(optional activity to be chosen from list below)
3. _____
(optional activity to be chosen from list below)

B. Education In The Out-of-Doors

1. Prehistoric Life In Michigan -
A Fossil Dig In Barry County
2. Observing Pond Life In The Fall -
The Food Chain
3. Understanding Our Environment -
The "Grand Canyon" Of Barry County
4. _____
(optional activity to be chosen from list below)
5. _____
(optional activity to be chosen from list below)

OPTIONAL ACTIVITIES

A. Education For The Out-of-Doors

1. Archery
2. Arts & Crafts Using Native Materials
3. Cooking Out
4. Fishing In Clear Lake
5. Gun Safety And Introductory Marksmanship
6. Orienteering On A Compass Course

B. Education In The Out-of-Doors

1. Understanding Our Environment -
A Visit To A Sphagnum Bog
2. Visit To A Beef Farm
3. Visit To A Dairy Farm

OUTDOOR EDUCATION CENTER
BATTLE CREEK PUBLIC SCHOOLS

RECOMMENDED WINTER OUTDOOR SCHOOL PROGRAM FOR NON-BATTLE CREEK DISTRICT STUDENTS

A. Education For The Out-of-Doors

1. Cooking Out
2. _____ _____
(optional activity to be chosen from list below)
3. _____
(optional activity to be chosen from list below)

B. Education In The Out-of-Doors

1. Discovering Michigan Rocks
or
Prehistoric Life In Michigan -
A Fossil Dig In Barry County
2. Winter Pond Life
"Probing For Plankton"
3. Understanding Our Environment
Exploring In The Cedar Creek Watershed
4. _____
(optional activity to be chosen from list below)
5. _____
(optional activity to be chosen from list below)

OPTIONAL ACTIVITIES

A. Education For The Out-of-Doors

1. Arts and Crafts Using Native Materials
2. Gun Safety and Introductory Marksmanship
3. Ice Fishing On Clear Lake

B. Education In The Out-of-Doors

1. Animal Tracking In Winter
2. Drop-off Hike
3. Visit To A Beef Farm
4. Visit To A Dairy Farm
5. Winter Lake Exploration

OUTDOOR EDUCATION CENTER
BATTLE CREEK PUBLIC SCHOOLS

SPRING OUTDOOR SCHOOL ACTIVITIES FOR NON-BATTLE CREEK DISTRICT STUDENTS

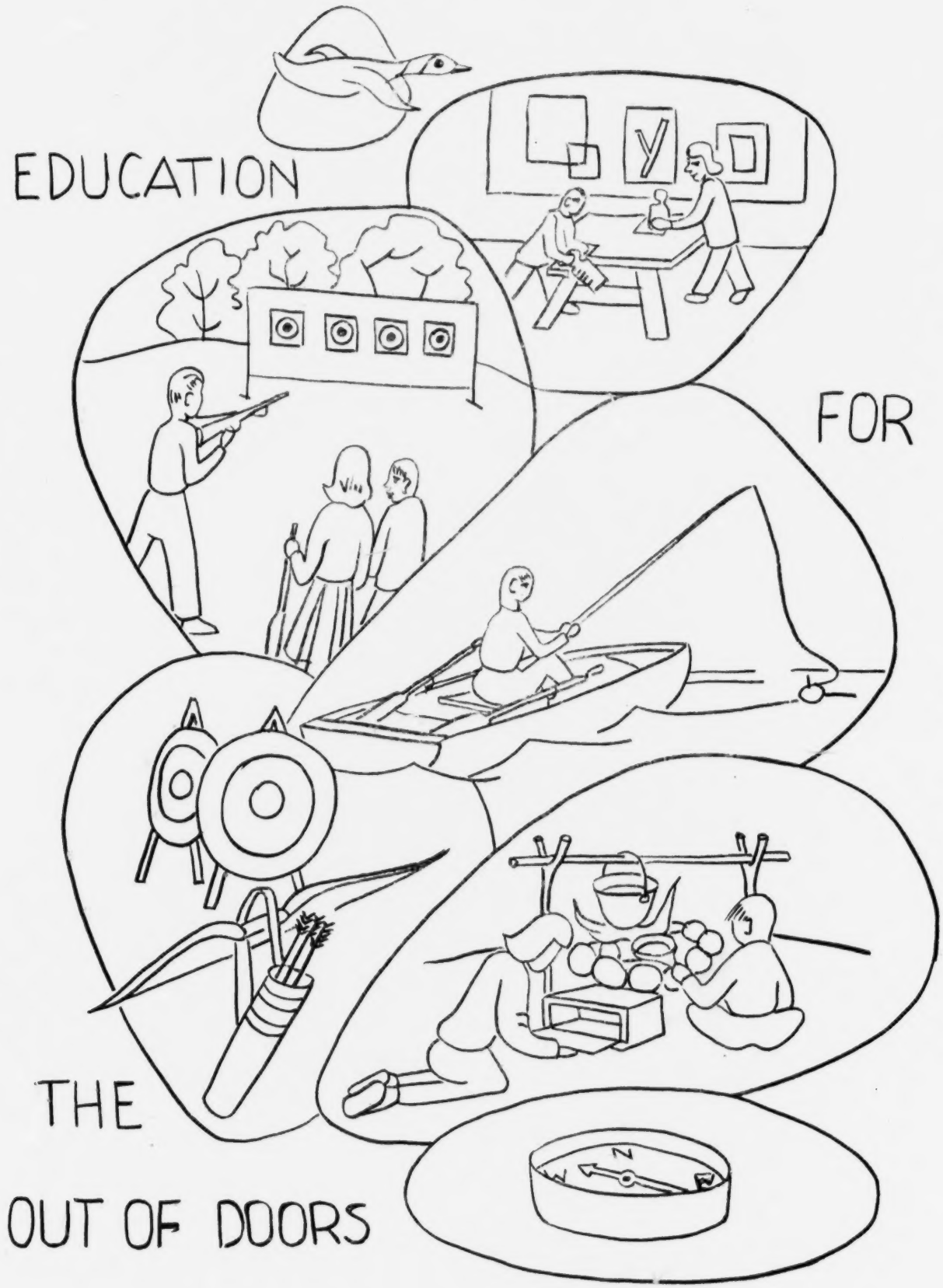
A. Education For The Out-of-Doors

1. Archery
2. Arts and Crafts Using Native Materials
3. Boating
4. Cooking Out
5. Fishing In Clear Lake
6. Gun Safety and Introductory Marksmanship
7. Orienteering On A Compass Course

B. Education In The Out-of-Doors

1. Discovering Michigan Rocks
2. Drop-off Hike
3. Prehistoric Life in Michigan
   A Fossil Dig In Barry County
4. Understanding Our Environment -
   Exploring In The Cedar Creek Watershed
5. Observing Pond Life In The Spring -
   Plankton And The Food Chain
6. Understanding Our Environment -
   The "Grand Canyon" Of Barry County
7. Visit To A Beef Farm
8. Visit To A Dairy Farm

Note: Each class should select eight activities to comprise their program.


EDUCATION
FOR
THE
OUT OF DOORS

ARCHERY

A. ACTIVITY RATIONALE

Archery is becoming more popular as an interesting field sport for children, and it also is becoming popular as family and adult recreation. As with other skill sports, archery appeals to girls as well as boys. The teaching of archery skills can begin with children in the upper elementary grades and should progress and continue into secondary schools and colleges.

There has been a steady growth of bow and arrow hunting in Michigan in recent years, and archery equipment will more frequently be falling into the hands of young people. As the sport grows in popularity, safety is becoming an important phase of instruction.

The archery experience at the Outdoor School is designed to introduce archery to children as a skill sport which can have continued carry-over value in later years of their lives. Emphasis will also be placed on identification and proper use of equipment, practice in skill proficiency, and safety practices.

B. RECOMMENDED GRADE LEVEL

This is an optional fall activity for sixth grade Battle Creek students.

The activity is also optional for out-of-district students and is applicable at either the fifth or sixth grade level.

C. BACKGROUND INFORMATION FOR TEACHERS

The Outdoor School maintains an adequate outdoor range with ample equipment to permit participation by an entire class. In order to meet recommended standards for children of elementary age the shooting equipment employed is lighter weight.

The Outdoor School maintains the following equipment for instructional use: targets, target faces, bows, arrows, quivers, arm guards, and finger tabs.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Weather is a key factor. Archery is conducted regularly in the fall season as long as fair weather persists.

E. DESCRIPTION OF ACTIVITY

The following outline for the activity is suggested:

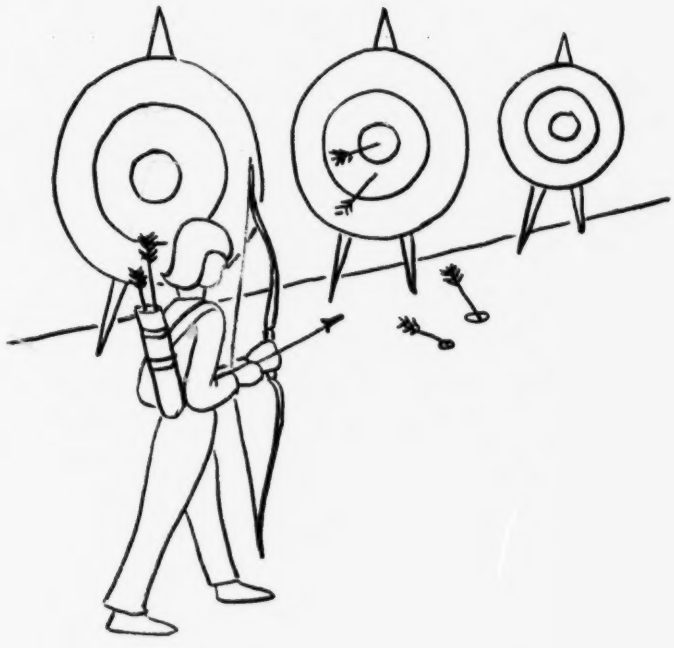
1. Introduction to Archery

    a. Brief history
    b. Value of sport

2. Equipment and facilities

    a. Bow selection
    b. Arrow selection
    c. Arm guards--necessity in wearing them
    d. Quiver
    e. Target

3. Care of equipment
4. Stringing and unstringing the bow
5. Stressing of safety
6. Arrow parts
7. Nocking
8. Stance
9. Draw
10. Aim
11. Release



GUN SAFETY AND INTRODUCTORY MARKSMANSHIP

A. ACTIVITY RATIONALE

Children's attention is drawn to guns at an early age. At the upper elementary age the desire to play with harmless toy guns fades, and the desire to have the experience and thrill of using and handling real guns becomes evident. It is at this age that many children become the owner or user of a simple but real gun, the air rifle. The first instruction in the care and use of guns is recommended during elementary school age, and a good place to start is with the air rifle.

There are two major areas relative to the use of guns: shooting for developing a skill, i.e. marksmanship, and shooting in the field as a skill sport in pursuit of wildlife, i.e. hunting. Both of these areas demand knowledge of the proper use and handling of guns to ensure the safety of all individuals. Hunting safety is a topic of concern in many states every fall. Recognizing the need for knowledge of gun safety the Michigan legislature has passed legislation requiring minors to pass a gun safety course before they are issued hunting licenses in Michigan. The purpose of the legislation is to prevent accidents by young hunters.

The gun safety and marksmanship experience at the Outdoor School is designed to educate boys and girls in the proper use and handling of spring-type air rifles. It is also designed to introduce marksmanship as a skill sport which can be developed and pursued over a lifetime. In addition emphasis will be placed on introducing elementary techniques of gun handling while moving about in the field. This instructional program should provide, specifically, a good introductory background for those boys and girls who will maintain an interest in hunting during their teenage years and will be applying for hunting licenses.

B. RECOMMENDED GRADE LEVEL

Recognizing that the child's interest in guns intensifies as he grows older, this experience is recommended for sixth grade students.

C. BACKGROUND INFORMATION FOR TEACHERS

The outdoor school maintains an adequate outdoor range with ample equipment to permit participation by an entire class. Lightweight spring-type air rifles are employed. Official National Rifle Association targets and certificates are used for marksmanship instruction. Children who demonstrate marksmanship ability are presented appropriate award certificates as a reminder of their success.

Two main areas are used for instruction. Introduction to the guns and dry firing are taught inside the camp lodge. Live firing is taught on the outdoor range. All instructional techniques employed by the Outdoor School teaching staff are N.R.A. approved.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Weather is not a critical factor. Outdoor instruction can be conducted throughout the fall except during rain. If necessary, an indoor range for live firing can be set up and utilized.

E. DESCRIPTIVE OUTLINE OF THE ACTIVITY

1. Introduction

    a. General discussion of guns

        1. Parts
        2. How they work

    b. Demonstration of various kinds of guns

        1. Shotgun
        2. Rifle
        3. Handgun
        4. Air rifle

2. Dry Firing Instruction

    a. Correct prone position and holding the gun
    b. Sight picture
    c. Trigger squeeze
    d. Firing line safety rules

3. Range Procedure Instruction

   a. Always point muzzle down range or angled up away from anyone else.
   b. Three students work together: firing position, cocking position, and shot caller.
   c. Commands

      1. Assume position (by range coach)
      2. Cock the guns
      3. Ready on the firing line
         Ready on the right
         Ready on the left

      4. Take aim
      5. Fire one round (three-five roun

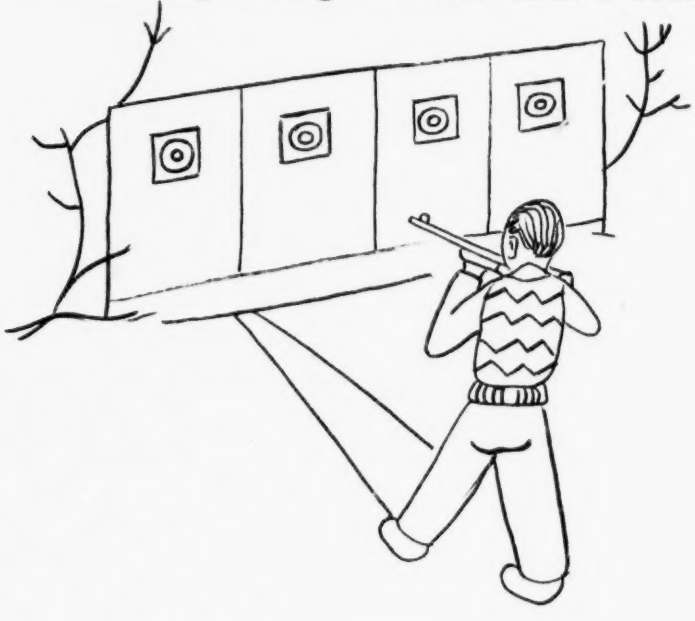
4. Range Firing

   a. Loading and unloading BBs
   b. Firing to command
   c. Replace targets for next person (on command only)

5. Shooting For Marksmanship

6. Safety Techniques In The Field

   a. Walking with an unloaded gun
   b. Walking with a loaded gun
   c. Crossing over a fence or stile with a gun
   d. Crossing through a fence with a loaded gun



FISHING IN CLEAR LAKE

A. ACTIVITY RATIONALE

Fishing is man's oldest form of outdoor recreation, and it is claimed to be the most popular field sport in the world. Whereas our ancestors depended upon fishing largely as a source of food, man enjoys fishing today as a sporting activity. It is estimated that over thirty million persons become involved in fishing each year. In Michigan, where lakes and streams are abundant, fishing is a very popular outdoor activity pursued by both children and adults. Many carry-over activities such as target casting, fly tying, and constructing equipment can be developed which stem from one's interest in fishing; these activities are known to have life-long values.

Children become interested in fishing at an early age. In the past when most children lived in a more rural environment, they were exposed to fishing as a part of growing-up, and the opportunity to acquire needed skills from parents or relatives was greater. However, in today's highly urban environment the opportunity for children to learn the skills in the home is greatly removed, and it becomes necessary for educational programs to provide children with a background of outdoor skills.

The fishing activity at the Outdoor School is designed to introduce fishing to children as a skill sport and activity which can have lasting carry-over value throughout their lives. The activity is also designed to provide children with a knowledge of all aspects of fishing and acquaint them with the various types of fish present in a typical small lake in southern Michigan.

B. RECOMMENDED GRADE LEVEL

This is an optional fall activity for sixth grade Battle Creek students.

The activity is also optional for out-of-district students and is applicable at either the fifth or sixth grade level.

C. BACKGROUND INFORMATION FOR TEACHERS

A live display of the six kinds of fish most likely to be caught in Clear Lake are on exhibit in the Fish Room in the camp lodge. Children view the live fish before beginning outdoor activity.

There is ample lake shoreline for fishing. Children are also permitted to fish from the docks in the swimming area. Fishing is not permitted from boats.

Children may use their own equipment if they wish. However, the outdoor school provides ample equipment to permit participation by an entire class. Cane poles complete with hook, line, bobber, and sinker are available for use. A worm bed is available for securing bait, or other types of bait such as grubs, insects, or larvae can be gathered in the field. Cans for storing bait are also provided.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Fall is a good season for fishing in Clear Lake. However, weather conditions can influence the success of the activity; windy and cold days are not favorable, particularly late in the season.

E. DESCRIPTIVE OUTLINE OF THE ACTIVITY

1. Indoor Orientation

   a. Discussion of Clear Lake

      1. Depth
      2. Temperature
      3. Plant growth

   b. Discussion of fish in Clear Lake

      1. Types

         Bluegill
         Sunfish
         Large mouthed bass
         Bullhead
         Perch
         Pickerel

      2. Abundance

   c. Discussion of the parts of the fish and their function.
   d. Discussion of hooks and lures
   e. Discussion of live baits

2. Bait Digging

3. Outdoor Demonstration

   a. Preparing a cane pole

      1. Placing the line on the pole
      2. Attaching the hook to the line
      3. Attaching the sinker to the line
      4. Attaching the bobber to the line
      5. Placing the bait on the hook

   b. Casting the line
   c. Discussion of safety factor

4. Cane Pole Fishing in Clear Lake

5. Live Demonstration of Cleaning a Fish

6. Post Discussion

   a. Other methods of fishing
   b. Kinds of areas where one may fish
   c. Other kinds of equipment used in fishing
   d. Game laws, licenses, and fishing seasons
   e. Methods of cooking fish

BOATING

A. ACTIVITY RATIONALE

Michigan with its many lakes and streams is one of the leading states in promoting water activities. Fishing, water sports, and other recreational pursuits have made the use of boats commonplace in the state. With increased availability of leisure time, more persons now participate in boating activities than ever before.

Boating as an outdoor skill is appealing to the elementary age child. Most children in the upper elementary grades are physically capable of rowing a boat. However, although most Michigan youth will have the opportunity to take a boat out on open waters, many lack needed skills and the knowledge of safety procedures.

The boating experience at the Outdoor School is designed to provide basic instruction in the use of a rowboat. Emphasis will be placed on skill proficiency and the need for sound safety practices. The experience is also designed to introduce boating as an outdoor skill activity that can be both combined with and expanded into other water activities for recreational purposes that can be pursued over a lifetime.

B. RECOMMENDED GRADE LEVEL

This activity is recommended for inclusion in the sixth grade program for Battle Creek students.

This is also a recommended fall activity for non-Battle Creek district students and is applicable at either the fifth or sixth grade level.

C. BACKGROUND INFORMATION FOR TEACHERS

Boating instruction is conducted in the cove at Clear Lake north of the lodge. There are ten rowboats with oars attached. The boats contain three seats. They have flat bottoms which make them more stable on the water and difficult to tip. Life preservers are available which must be worn by children at all times when they are in the boats. Boating is not permitted when the lake is rough and whitecaps appear. The Outdoor School maintains a specific set of safety rules. These rules are reviewed for the students by an Outdoor School staff member prior to each time the boats are used.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Fall is an ideal season for boating activity. However, weather conditions can be a factor. Windy days are usually unsatisfactory as children have difficulty in maneuvering the boats.

E. DESCRIPTIVE OUTLINE OF THE ACTIVITY

1. Orientation For the Activity

a. Learning the parts of a rowboat

1. bow
2. stern
3. oars
4. oar lock
5. gunwhale

b. Demonstration of boating procedures

1. Proper way to enter a boat
2. How to shove off from shore
3. How to sit in a boat and keep it balanced
4. Proper way to beach a boat

c. Demonstration of the methods of rowing

1. Rowing the boat forward
2. Rowing the boat backward
3. Rowing the boat to the right
4. Rowing the boat to the left

d. Reviewing the safety rules

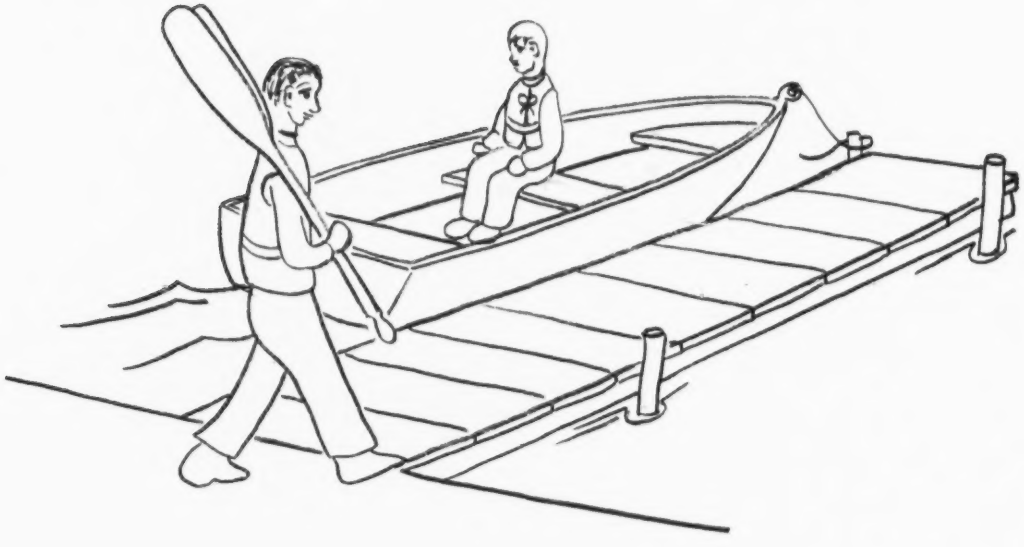
1. Life preservers must be worn while in the boats.
2. Only one person rows at a time.
3. No one is permitted to change seats with the rower while the boat is away from shore.
4. No one is permitted to stand up in a boat when it is away from shore.
5. Do not lean over the sides of the boat.
6. Boats must be kept under control and a safe distance from nearby boats.
7. No unnecessary splashing or horseplay is permitted.

2. Putting on Life Perservers

3. Boating on Clear Lake

   a. Each child demonstrates his ability to operate his boat.

   b. Free boating.



ARTS AND CRAFTS USING NATIVE MATERIALS

A. ACTIVITY RATIONALE

Native materials are ideal for craft work, and they are readily available in the camp setting. Securing craft materials in their native environment may stimulate more creativity and be more relevant to the child than working with prepared materials in the classroom. The creative skills of native arts and crafts are valuable in instilling a feeling of self expression within the individual child as well as providing a feeling of self-accomplishment.

The arts and crafts experience at the outdoor school is designed to directly relate the child's artistic experiences with the out-of-doors. The outdoor environment is presented as a source of many available materials which can be utilized in creative craft projects. The primary focus of children working in the craft room is learning how to use some of the available native materials in this area in arts and crafts projects.

B. RECOMMENDED GRADE LEVEL

This is an optional fall activity for sixth grade Battle Creek students.

The activity is also optional for out-of-district students and is applicable at either the fifth or sixth grade level.

C. BACKGROUND INFORMATION FOR TEACHERS

The outdoor school maintains a craft room in the basement of the lodge. Examples of suggested projects are on display. Children gather native materials in the field before beginning a project. Children choosing to work with clay dig the clay in nearby farm fields. All supplemental materials needed for completing a project are available in the craft room. Tables, benches, and simple tools needed for carrying out the activity are also available. If a project is not completed in the time available, children are encouraged to take the project back to school or home for completion.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Fall is an ideal season for craft work due to the abundance and variety of native materials that are readily available. It is therefore an ideal season for the construction of collages. It is also the most ideal season for digging clay.

E. DESCRIPTIVE OUTLINE OF THE ACTIVITY

1. Orientation for the Activity

   a. Becoming acquainted with the facilities of the craft room.

   b. Reviewing the suggested projects that may be pursued.

      1. Clay
         medallions
         masks
         pots
         necklaces
         ear rings

      2. Collages

      3. Wooden jewlery
         ear rings
         medallions
         tikis
         pins
         rings

   c. Selecting a project

2. Gathering or selecting materials to be used.

3. Working on a project in the craft room.

COOKING OUT

A. ACTIVITY RATIONALE

Cooking an outdoor meal is a favorite outdoor activity enjoyed by thousands of American families. Building and cooking over the open fire demands more skill than home cooking and a deeper appreciation for outdoor living.

Although one person can successfully conduct his own cookout, this type of activity is more adaptable as a group activity in which each person assumes a role to fulfill to ensure a successful outcome.

The cookout experience at the outdoor school is designed to introduce the cookout to the student as a group activity which demands both needed skills as well as group interaction through teamwork. The activity focuses on the need for careful planning in selecting a site, determining a menu, and exercising safety precaution.

B. RECOMMENDED GRADE LEVEL

This is an optional fall activity for sixth grade Battle Creek students.

The activity is also optional for out-of-district students and is applicable at either the fifth or sixth grade level.

C. BACKGROUND INFORMATION FOR TEACHERS

Children plan a menu for, carry out adequate preparation for, and eat, as a group, a well balanced meal which will fit into the total day's nutritional needs.

Many cookout sites are available in the camp area on both sides of the lake. Children choose a site in accordance with weather conditions and time available. Children ready the site for cooking and gather dead wood in the camp woods for firewood. Food is prepared and packed in the lodge. A supply room for cookout equipment is maintained in the basement of the lodge.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Fall is usually the most ideal season during the school year for cooking out as far as the probability for good weather is concerned. If the season is extremely dry, extra caution needs to be exercised in caring for the campfires.

E. DESCRIPTIVE OUTLINE OF THE ACTIVITY

1. Organizing for the Cookout

   a. Selecting a balanced menu

      1. meat
      2. vegetable
      3. salad
      4. beverage
      5. dessert

   b. Determining needed equipment
   c. Preparing the food
   d. Packing needed equipment

2. Choosing and preparing the site

3. Cooking the meal

4. Cleaning up the site

5. Returning and cleaning up equipment

6. Post activity discussion at the Outdoor School

   a. How successful was the activity?
   b. How well did the class work together as a group?
   c. What skills are important for the success of the activity?

ORIENTEERING ON A COMPASS COURSE

A. ACTIVITY RATIONALE

The compass is a fascinating instrument which captures the interest of children. Although the use of the compass can be adequately learned at school or home, its use is more meaningful in an outdoor environment where space is plentiful.

The use of the compass is of prime interest to persons engaging in many outdoor activities. Persons who participate in camping, hiking, hunting, and fishing find the compass a valuable tool.

The experience in orienteering on a compass course at the outdoor school is designed to teach the student the skill of using a compass and introduce him to the art of pacing. This activity should be presented to the student as one of many recreational activities involving the use of a compass that can be pursued over a lifetime.

B. RECOMMENDED GRADE LEVEL

Recognizing that this activity involves some mathematical skill that can best be performed by the more mature student, this activity is recommended for sixth grade students.

C. BACKGROUND INFORMATION FOR TEACHERS

The outdoor school maintains a compass course on a level field area adjacent to the west side of Mystery Swamp. A series of permanently marked stakes are strategically placed at measured intervals. Pacing is taught on the course. Children work in pairs. The main function of the activity is to follow a set of written directions which indicates a series of distances and directions the students are expected to follow to various locations (stakes) on the course. When the students complete one set of directions, they check their answers for accuracy with the instructor and then proceed to a new set of directions. The compass course is large enough to permit an entire class to work simultaneously. Compasses, clipboards, pencils, and printed materials are provided by the Outdoor School.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

This activity is dependent upon good weather conditions. Rainy and/or cold days in late fall are prohibitive. However, the activity can be conducted throughout the fall as long as warm days prevail.

E. DESCRIPTIVE OUTLINE OF THE ACTIVITY

1. Indoor Orientation

   a. Discussion on the compass

      1. History of the compass
      2. Principle of the compass
      3. Theory of magnetism

   b. What is a compass course?

   c. What is pacing?

2. Outdoor Orientation

   a. Demonstration - how to use the compass on the course
   b. Demonstration - determining one's pace
   c. Demonstration - following a set of directions on the course

3. Determining each student's pace

4. Working on the course

5. Post activity discussion

   a. How successful was the activity?
   b. How does one construct a compass course?
   c. What are other related compass activities?

EDUCATION

IN THE

OUT OF DOORS

VISIT TO A DAIRY FARM

A. ACTIVITY RATIONALE

Dairy farming has long been one of the integral land uses in southern Michigan, and milk as a product is a prime example of man's dependence upon the land as a source of food for his existence. In earlier years dairy cattle production was a part of the operation of the "general" farm. However, in this era of specialization larger specialized dairy farms have emerged as a result of the gradual disappearance of the smaller "general" farms. The story of milk production is particularly fascinating to children who are the prime consumers of the product and its byproducts. This activity is designed to provide children with an understanding of all aspects of dairy farming and demonstrate the importance of the role that dairy farming plays in our lives.

B. RECOMMENDED GRADE LEVEL

This is an optional fall activity for non-Battle Creek district students only and is applicable at either the fifth or sixth grade level.

C. BACKGROUND INFORMATION FOR TEACHERS

The dairy farm is located along M-37 about ½ mile south of the entrance road to the Outdoor Education Center. The entire acreage of the farm is devoted to the practice of modern dairy farming. The farmer maintains a herd of over 40 milking cows. Usually there are calves and young heifers in the barn.

The barn is large and is kept in clean condition providing an opportunity for children to view all the functions of the dairy farm. Hay is stored in the upper level of the barn; a modern silo filled with silage adjoins the building. Fresh milk is stored in a bulk cooler in a separate room along with automatic milking equipment.

Farm machinery is stored in adjacent buildings.

During the growing season the cows are pastured in some of the adjacent fields, while feed crops such as hay and corn are grown in other fields.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Dairy farming is a continual operation; however, routine daily activity is partially seasonal in nature. A visit to the farm during the fall season should also focus on what preparations the farmer is making for operation during the winter season.

E. DESCRIPTION OF ACTIVITY

The following outline for the activity is suggested:

1. Orientation at the Outdoor School

   a. Establish rationale for the visit
   b. Outline details of the hike
   c. Establish behavioral expectations while visiting the site

2. Explore the barn yard

   a. Observe cattle: number present, various ages, kind of cattle
   b. Observe feeding areas and kinds of food
   c. Discuss special physiological features of the cow (cud chewing, two stomachs, etc.)
   d. Observe the silo and its contents

3. Explore the lower level of the barn

   a. Observe young calves and their food
   b. Observe and identify the mechanized milking equipment
   c. Observe the stanchions, watering system, and feeding troughs
   d. Observe the milk room and the bulk cooling and storage tank

4. Explore the upper level of the barn

   a. Observe hay and hay storage area
   b. Observe ropes and pulleys for storing and removing hay
   c. Observe other foods stored in the area
   d. Observe equipment stored here

5. Note and determine use of other farm buildings

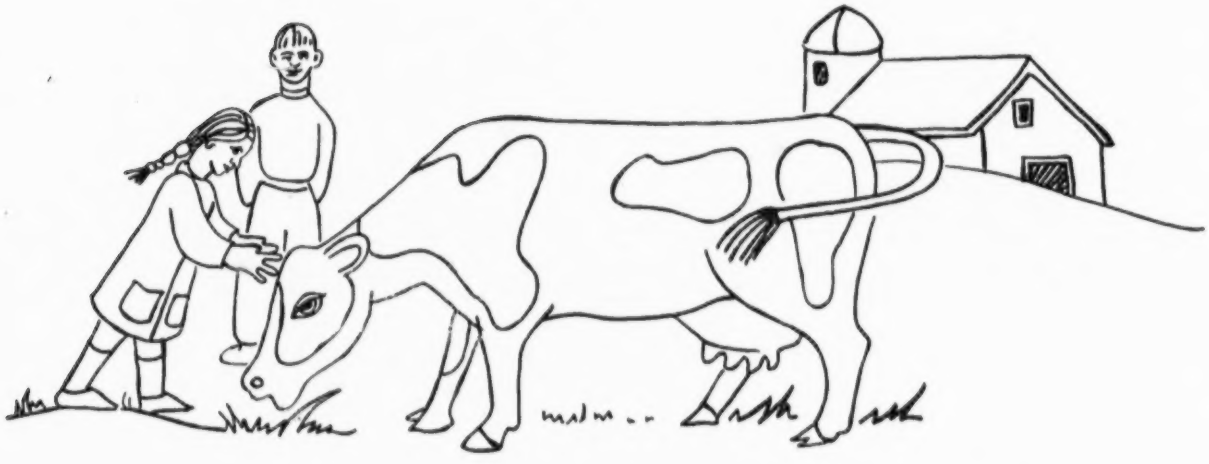
   a. Pole barn
   b. Tractor shed
   c. Tool shed

6. Explore adjacent farm fields and note land uses

   a. Fields used for pasture
   b. Fields where hay is grown
   c. Fields where grain crops are grown

7. Post activity discussion at the Outdoor School

   a. Effect of dairy farming on our lives
   b. Implications of mechanization to farming
   c. Different breeds of dairy cattle (illustrate with slides)
   d. How the various kinds of machinery operate (illustrate with slides)
   e. Importance of cleanliness in dairy farming
   f. How the seasons and weather affect dairy farming
   g. Transportation and marketing of milk (illustrate with slides)



VISIT TO A BEEF FARM

A. ACTIVITY RATIONALE

Beef cattle production is now an integral part of Michigan agriculture; within recent years there has been a sharp increase in the number of Michigan farms specializing in beef cattle production and a corresponding sharp decline in the number of "general" farms which were once more characteristic of rural areas. Despite this change man, who now exists primarily in an urban environment, is even more dependent upon this phase of agriculture for his existence. This activity is designed to acquaint children with an operation as it exists on a typical southern Michigan farm and indicate its relationship to man's dependence upon the land for his own existence.

B. SUGGESTED GRADE LEVEL

This activity is recommended for inclusion in the sixth grade program for Battle Creek students.

This is an optional fall activity for out-of-district students and is applicable at either the fifth or sixth grade level.

C. BACKGROUND INFORMATION FOR TEACHERS

The beef farm is located along M-37 adjoining the boundary of the Outdoor Education Center. The farm extends over 600 acres in separated parcels of land on both sides of Clear Lake. The farm buildings have been converted from a "general" farm into a highly specialized operation.

During the later part of the fall season the farmer buys young calves to raise and market when ready for slaughter. There are usually about 125 head in the herd. The cattle are usually kept about one year, being marketed early in the fall season.

Much of the feed for the animals is raised on the farm. Corn is cut as Silage and stored in the silo. Hay is stored in the barn.

The cattle are housed in the lower part of the barn and in adjacent pens. During the fall season the young stock often graze over harvested fields. During the winter season they are confined to the barn and the barnyard.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Weather is not a factor; the farm may be visited anytime. During the early part of the fall season the cattle will be mature, ready for marketing. During the later part of the season young cattle will be at the farm. It is possible that for several weeks in mid-Autumn there will be no cattle at the farm.

E. DESCRIPTIVE OUTLINE OF THE ACTIVITY

1. Orientation to the Activity

   a. What are beef cattle?
      1. various breeds
      2. relationship to man's existence

   b. What is a specialized farm?

2. Hiking to the Farm

3. Observing the Cattle

4. Observing the Buildings and Pens

   a. Types of feed grains stored
   b. Other types of feed stored
   c. The silos
   d. Shelter for animals
   e. Equipment sheds and stored machinery

5. Observing Nearby Fields

   a. Apparent use
   b. Estimating the acreage
   c. Examining the soil and topegraphy and its effect on the farm operation

6. Post Activity Discussion at the Outdoor School

   a. Implications of mechanization to this type of farming.
   b. Beef cattle, what a year of their life is like
      1. feeding methods
      2. meat production

   c. Evidence of good and poor farming practices
   d. Relationship of this type of farming to the seasons and weather
   e. Transportation and marketing of stock
   f. The government and farming
   g. Importance to man of this type of farming

PREHISTORIC LIFE IN MICHIGAN-
A FOSSIL DIG IN BARRY COUNTY

A. ACTIVITY RATIONALE

Man's place, historically speaking, in the whole development scheme of the planet on which he lives, has always been a fascinating subject to explore.

Within recent years, the geological sciences have made tremendous contributions to our knowledge of the development of life on earth over the last two billion years.

Elementary children have already been "tuned in" to some of this knowledge as evidenced by their universal interest in dinosaurs, etc.

The "Fossil Dig" experience at the Outdoor School is designed to broaden the students' concept of "life in the past" through a combination of laboratory and field work with invertebrate fossils that can be found in Barry County.

B. RECOMMENDED GRADE LEVEL

This activity is designed to be the second of two exploratory experiences in geology for Battle Creek students and is recommended for inclusion in the sixth grade program.

This is also a recommended fall activity for non-Battle Creek district students and is applicable at either the fifth or sixth grade level.

C. BACKGROUND INFORMATION FOR TEACHERS

During the last 500 million years, Michigan has been covered several times by ancient seas. The sea bottom during each period of indunation served as a collecting surface and agency for the preservation, through fossilation, of many of the now extinct life forms that lived in the warm shallow seas of those past geologic periods.

After the seas disappeared for the last time, about 240 million years ago, the great limestone, sandstone and shale beds, formerly sea bottom material and now solid bedrock, were exposed to the air. During the millions of years that followed, these rock beds were eroded, layer by layer, freeing and destroying the enclosed fossil remains along with the rock into the Michigan landscape as it appeared about one million years ago.

At that time, a new erosive force developed--the first of four great ice sheets swept down from the north tearing off large amounts of the ancient sea bottom bedrock. As this bedrock material was carried south by the ice and glacial meltwater, the large pieces were worked into increasingly smaller pieces. A heterogeneous mixture of sand, gravel and clay was finally produced and eventually spread over the entire state as the last ice sheet retreated back to the north about 10,000 years ago.

We find fragments of fossil remains in this glacial till freed from the original bedrock layers that preserved them millions of years earlier.

The glacial till covers the lower peninsula of Michigan to an average depth of 150 feet and contains rock, mineral and fossil representatives from many geologic periods spanning hundreds of millions of years.

Students will have an opportunity to make some first-hand observations on the fossils contained in the glacial till as they go on a "Fossil Dig" in a gravel pit near Clear Lake.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Fall is an ideal season for exploration in a gravel pit. The area is usually dry and easy to maneuver in. However, due to the nature of the activity, fossil hunting is not associated with any specific season.

E. DESCRIPTION OF ACTIVITY

ROCK LAB ORIENTATION

1. Use nautiloid fossil as a "mystery rock found in a creek bottom" to introduce activity - create complete drawing of nautiloid specimen as children try to match drawing with geologic period pictures on the Rock Lab time line.

2. Discuss time line - extend line back to hypothetical beginning of the earth (8 times around the room).

3. Use transparency CID 21 - have children match pictures on visual with geologic time period on time line. Point out the rise and fall of animal groups.

4. Develop idea that the time line animal and plant information was constructed on the basis of fossil evidence found in the rocks of different ages--show several fossils--emphasize fragmentary nature.

5. Use transparency CID 22 to show that whole animals are not always found--parts indicated are most commonly found.

6. Let children have some experience with some fossils they can hold--distribute green boxes, one box per two children. Let students examine specimens for a moment.

7. Now ask class to examine their individual specimens and in timed intervals have them do the following:

   a. count the number of fossils on their hand specimen.
   b. count the <u>different</u> kinds of fossils on their hand specimen.
   c. match any fossil on their hand specimen with a geologic period on time chart.

8. Students should now be interested in searching the glacial till for some fossils they can find themselves.

9. Suggest that, before they go on a "Fossil Dig" near Clear Lake, they should know whether or not any ancient seas covered Michigan to produce some fossil beds.

Show filmstrip "The Story Fossil's Tell," frame #25 and 26---pictures areas of North America covered by ancient seas.

10. Organize for field work--each child should bring back 4 or 5 hand specimens for examining in the Rock Lab. In addition, each team should have a rock hammer and collecting satchel or box and a pocket magnifier.

FIELD STUDY

1. Organize students by teams--cover ground rules for safe behavior in pit--encourage a lot of exploratory activity.

2. Do not discuss rock types with students--this is a "fossil dig"--keep students thinking fossils.

3. Each time a student finds a fossil, announce the find to the rest of the class to encourage greater activity.

4. Teacher should not pass judgment in the field on whether or not rocks shown by the students are fossils--this judgment is to be made back in the lab. General encouragement should be given to take back all "suspect rocks".

ROCK LAB FOLLOWUP

1. Have children use (10%) <u>acid test</u> to begin fossil identification procedures.

   a. Divide specimens into two groups:
      Group 1. rocks that fizz (bubble)
      Group 2. rocks that do not fizz (bubble)
   b. Examine group 1 rocks very carefully---compare any shapes or patterns on the specimens with fossil identification book. pp. 81-132

2. Children that do not have any group 1 rocks can examine the rock lab fossil bucket.

F. SUGGESTED CLASSROOM ORIENTATION ACTIVITIES (PRE-OUTDOOR SCHOOL)

Activity One - Recognizing A Fossil In A Rock

1. Obtain traveling fossil collection from the Kingman Museum (tel. 5-5715).

2. Have students look at some of the specimens to determine the following:

   a. Is the fossil a cast, print or original animal?
   b. Which part of the animal is visible: the shell skeleton, teeth, or other parts?
   c. Is the fossil complete or only part of the animal or plant?
   d. Is the fossil made of the same kind of material as the rock in which it is found?

Activity Two - How Fossils are Formed

1. Obtain "Fossils Filmstrip - Record" from A-V Department (tel. Ext. 231) and use filmstrip 10951 C SD.

2. By using the filmstrip, the teacher will be able to provide students with information on the following:

   a. Identification of a fossil.
   b. Conditions necessary for fossilization to occur.
   c. Why most organisms do not become fossils.

G. SUGGESTED CLASSROOM FOLLOWUP ACTIVITIES (POST-OUTDOOR SCHOOL)

Activity One - Filmstrip Viewing and Discussion for More Information on Fossils

1. Additional information you may wish to develop about fossils:

   a. How fossils are formed.
   b. Fossils and organic change.
   c. Fossils and prehistoric environments.
   d. Collecting and interpreting fossils.

2. To develop this information, use the "Fossils" filmstrip available from the A-V Department (tel. Ext. 231)

H. GENERAL BIBIOGRAPHY OF LOCAL MATERIALS

1. Audio-Visual (tel. 962-5581, Ext. 231)

   a. Age of Mammals (fs)
   b. Beginning of Life (fs)
   c. Coming of Reptiles (fs)
   d. Dinosaur Age (F)
   e. Discovering Fossils (fs)
   f. Fossils are Interesting (F)
   g. Rise of Dinosaurs (fs)
   h. Stories Fossils Tell (fs)
   i. Triumph of Dinosaurs (fs)

2. Books - School Services Department, Willard Library

   a. They Turned to Stone
   b. Wonders of Fossils
   c. Fossils
   d. The Real Book About Prehistoric Life
   e. The Age of Reptiles
   f. All About Dinosaurs
   g. All About Strange Beasts of the Past
   h. Dinosaurs
   i. Discovering Dinosaurs
   j. Famous Fossil Finds
   k. The True Book of Dinosaurs
   l. Prehistoric World
   m. Life Through the Ages
   n. Monsters of Old Los Angeles
   o. Animals of Yesteryear
   p. What is a Dinosaur

VISIT TO A SPHAGNUM BOG

I. ACTIVITY RATIONALE

The extensive wetlands of southern Michigan are of considerable importance for waterfowl, ground water storage, and peat mining. In both Barry and Calhoun counties there are thousands of bogs that vary in size from small potholes, a couple of hundred feet in diameter to marshes of several hundred acres.

Many of the bogs have enough water in them to support ducks, geese, herons, and other common waterfowl of Michigan.

Much of the peat that is used for mulch for horticultural work is mined from these bogs.

In addition to the recreational and economic resources represented, the bogs are closely related to the origin and eventual demise of Michigan's many lakes.

This bog activity is designed to afford children an opportunity to discover and experience, first-hand, the physical properties, and the unique plant and animal communities of this important and abundant southern Michigan resource.

II. RECOMMENDED GRADE LEVEL

This activity is recommended for inclusion in the sixth grade program for Battle Creek students.

This is an optional activity for out-of-district students who may participate at either the fifth or sixth grade level.

III. BACKGROUND INFORMATION FOR TEACHERS

The bog represents one of the final stages in the evolution of a post-glacial lake to a near land condition. About six to eight thousand years ago this low lying area was filled with the cold melt waters of the retreating edge of the last great ice sheet that began its advance over North America approximately 100,000 years ago.

As the glacial retreat continued, the lake's water grew warmer and aquatic vegetation, both floating and bottom dwelling types, began to flourish. In the course of several thousand years the annual cycle of vegetation growth and death, and subsequent sinking to the bottom only to be covered by more plant remains, began to produce a thick brown layer of partially decomposed material called muck.

The muck layer continued to increase in thickness until the lake bottom was within a few feet of the surface. At this point several types of marsh shrubs were able to establish a foothold and flourish, thus contributing to an even more rapid filling of the now shallow water. Eventually either a prolonged dry period or continued buildup of the bottom caused the old lake bed to be exposed to the air, and a forest (probably northern white cedar) established itself. Remains of this extinct forest can still be found about two feet below the present bog surface.

The cedar forest then disappeared and marshland shrubs along with sphagnum moss began to thrive on the old forest floor. Once again the old lake floor began to rise rapidly. Today the present bog is covered with living sphagnum several inches thick. Tall marsh shrubs, including blueberries, crowd the area, and an occasional deciduous tree has found a place in the bog floor which is now high and dry enough to suit its needs.

IV. SEASONAL IMPLICATION FOR THIS ACTIVITY

Fall is normally the easiest season in which to explore around in a Michigan bog. The dryness of the season and the lowering of the water table make bogs more accessible.

The bog activity can be conducted anytime throughout the fall season except during periods of excessive wetness.

V. DESCRIPTION OF THE ACTIVITY

INDOOR BOG ORIENTATION

1. Tell students you would like to take them back about 10,000 years to the time when Clear Lake had its beginning---and that students will have a chance to visit a large dying lake that is a "sister lake" to Clear Lake.

2. Write the words "sphagnum, bog, peat moss, ground water, blueberry, extinct, and tannic acid" on the board. Tell students these words will be important during the bog visit.

3. Show by chalk board or use a transparency to illustrate the evolution of a bog from a sandy-bottomed clear water lake to a semi-wet land condition.

4. Use either the chalk board or a mechanical transparency to illustrate the evolution of a bog from a sandy-bottomed clear water lake to a semi-wet land condition.

   Have some samples of both dry and wet peat to show students so they can see what the bog-fill material looks, smells, and feels like.

   Demonstrate the combustability of the dried bog material as evidence for plant remains in the bog.

   Discuss the long time involved and the reasons for the accumulation of plant material. Relate this to similar, although slower, changes in Clear Lake.

5. Have students make some predictions about what they think they will see when they arrive at the bog. You might offer the following options:

   a wet muddy area
   a moist forested low area
   a grassy wet area
   a bushy-grassy wet area
   a quicksand trap

6. Tell students they will be digging a hole in the bog to see what the "inside" looks like---this may also give some "lucky classroom group" an opportunity to discover an event that took place about 2000 years ago. (A northern white cedar forest became extinct.)

7. Don't tell students what the discovery might be---but let them know that the remains of this event can be found at the 24 inch level, below the surface, in certain parts of the bog.

8. Organize for the bog trip by creating teams of five students. Each team should have a shovel and a #10 can.

   At times the bog will have enough water to get everyone wet to the knees---be prepared.

FIELD STUDY

1. Approach the bog via Thornapple Hill and the sawgrass hole.

2. En route to the bog each youngster might like to "go to Canada" by touching the large isolated granite boulder, of glacial origin, on top of Thornapple Hill. Appropriate discussion can follow.

   Bear west from the granite boulder down through the sawgrass hole. Continue west to the hilltop clearing in the thornapple forest.

   Discuss briefly the origins of the forest and ask students if they can see any signs of the "ecological battle" raging around them. Develop briefly the tree succession that is apparent in the area that will eventually eliminate the present thornapple forest.

3. Arrive at the east edge of the bog and relate the students' previous predictions of what they thought the bog would be like with what they see now.

4. Enter bog and move to the south side into an area of heavy sphagnum moss growth in a clearing in the shrubs.

   During the bog traverse, identify sphagnum moss and discuss some of the floral characteristics unique to a bog community.

   Show students how much water sphagnum moss can hold by squeezing a handful and collecting the water in a jar.

   Have each team collect a handful of sphagnum.

Have students try a "bog bounce". Alternate girls and boys. Relate observations to physical conditions of the material on which they are walking.

5. Have each team begin digging a hole in the bog floor--- encourage the students to examine the material they take out of the hole and notice what happens after a while in the hole itself.

   Remind the "bog diggers" that some of them may find the remains of the previously mentioned 2000 year old event.

   Have each team collect a ball of brown peat. Relate preservation of plant parts to the brown color which comes from the tannic acid in the bog. The high acidity has a bacteriastatic action.

6. After the holes have been dug to a depth of 24 inches, have students speculate on the probable depth of the peat and generally review the bog's history.

   Discuss present uses of wetland areas.

UNDERSTANDING OUR ENVIRONMENT -
THE "GRAND CANYON" OF BARRY COUNTY

A. ACTIVITY RATIONALE

Soil erosion has been and continues to be a major concern of persons working with the land. Farmers, lumbermen, highway planners, housing developers, and others who remove the natural vegetation, exposing the soil to the sun, rain, and wind, must consider the consequences of loss of soil fertility.

The "Grand Canyon" activity is designed in part to expose children to a dramatic example of extensive soil erosion, begun naturally, but accelerated by poor land management practices of surrounding landowners.

Students will have first hand experience with sheet erosion on croplands adjacent to the "Canyon" and will observe the effects of gully erosion on the surrounding farmland.

Another consequence of soil erosion children will look at beyond loss of soil and cropland fertility is stream pollution through silting. Children will observe the effects on the "Canyon" stream when there is a rapid runoff of water across exposed soil into the stream.

In addition to observing the effects of poor land management the "Canyon" will also give children some experiences with selected ecological relationships that exist in the small "Canyon" community of plants and animals. It is important that children become aware of some of the delicate relationships that exist in any community of living things. They should recognize that disturbing or changing one factor in one part of the living community can have serious consequences for other parts of the community. Several of these relationships can be easily identified and examined in the "Canyon".

B. RECOMMENDED GRADE LEVEL

This activity is recommended for inclusion in the sixth grade program for Battle Creek students.

This is also a recommended fall activity for non-Battle Creek district students and is applicable at either the fifth or sixth grade level.

C. BACKGROUND INFORMATION FOR TEACHERS

The "Grand Canyon" is a deep, V-shaped, wooded, ravine that cuts deeply into nearly a mile of rolling farmland. A small stream flowing through the gully empties into Cedar Creek.

The "Canyon" is unique because it is the only large erosional feature in the area that is so sharply delineated from the surrounding landscape. The "Canyon's" origins are probably closely related to surface drainage conditions that existed during the melting of the last glacial ice sheet. As the climate became more favorable, plants established themselves in the ravine and slowed the erosion processes.

In comparatively recent times the land was cleared of its protective trees by early settlers. The process of erosion was again accelerated. Within the last 50-60 years second growth timber has again covered the area. Evidence of continued erosion of the gully can be seen, but the process has been slowed.

In addition to its geological history the "Canyon" is also interesting ecologically. The moist warm slopes of the ravine in the early spring are carpeted with wildflowers. At least four species of ferns and a member of another ancient group of plants, the scouring rushes, is present.

The tree types include maples, beech, ironwood, sycamore, elm, and cherry. The oldest trees are 50-70 years old.

The stream and its immediate environs harbor salamanders, frogs, minnows, crayfish, aquatic insects, and numerous other invertebrate life forms associated with small, gravel-bottomed streams.

The wildflowers which grow on the sunny sides of the ravine include trilliums, columbine, spring beauty, violets, hepatica, adderstongue, Dutchmen's Breeches, meadowrues, Soloman's Seal and bloodroot.

The physical features of the ravine create major climatic differences between the top and bottom, thus affecting the types of plants and animals found living together in each of these zones.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Fall is an ideal season for exploration in the "Grand Canyon" since it is a relatively dry season. During most of the season children can hike in the stream bed rather than through the undergrowth. Even on damp, rainy days the area is suitable for hiking and exploration due to the dense canopy provided by the forest.

E. DESCRIPTION OF ACTIVITY

INDOOR ORIENTATION

1. The orientation should be brief. Sketch an aerial view of the area showing the drainage pattern and confluence of the "Canyon" with Cedar Creek; indicate forested and farmed areas.

2. Point out the area on a topographic map. Indicate the proximity of the area to the Cedar Creek watershed area.

3. Use a transparency to show valley development. Ask the students to try to determine whether the "Grand Canyon" is young, middle-aged, or mature, in terms of its development.

FIELD STUDY

After departing from the bus, indicate to the students that there will be several interesting areas to observe both on the hike to the "Canyon" as well as in the "Canyon".

Following is a descriptive outline of some key areas to observe and questions to explore.

1. SUMAC GROVE

This is a massive grove of Staghorn Sumac along the lane to the "Canyon". Sumac grows in open fields and roadsides; it spreads by roots. It is recognized by hairy twigs and leaves and bears red fruit when ripe.

Sumac is typically one of the pioneer tree types along with aspen and black cherry to make an appearance in abandoned field succession.

Questions To Explore:

A. WHY DO THE TREES GROW SO COMPACTLY?

Speculate on the trees' spreading by seeds or by roots. What evidence is there?

B. HOW DO YOU RECOGNIZE STAGHORN SUMAC'S POISONOUS COUSIN, SWAMP (POISON) SUMAC?

Compare twigs, berries, and leaves.

C. WILL THE SUMAC GROVE EVENTUALLY COVER THE ENTIRE FIELD?

Evidence for the eventual death of the sumac is visible; have students look for other nearby hardwoods. Develop plant succession story.

2. NUT TREES ALONG LANE TO CANYON

A number of Black Walnut and Shagbark Hickory trees are growing in the fence row on the south side of the lane.

The hickory trees can be recognized by their shaggy gray bark and alternate, compound leaves with 5-7 broad toothed leaflets. The twigs bear large brown buds. The nuts have thick husks, and the meat is edible and sweet.

The Black Walnut is a prized wood. The brown, fine-grained wood is used for furniture, gunsticks, and cabinets. The tree can be recognized by its large fragrant leaves of 15 or more leaflets, each finely toothed and ending in a long point. They are smooth above and hairy below.

The round nut grows in a thick green husk which the pioneers used in making a brown dye. It has a dark, irregular, hard shell that is hard to crack; the meat is edible. A large walnut tree may be worth $1,000 as it stands in the field.

Questions To Explore:

A. HOW ARE WALNUTS AND HICKORY NUTS ALIKE?

If possible, have students collect and examine both kinds of nuts and compare the taste, smell, and morphology.

B. ARE THE NUT TREES REPRODUCING?

Have students look for seedlings. Discuss implications of their findings.

3. FIELD EROSION

A prime example of massive loss of soil from a cultivated field over a large area can be seen at the edge of the "Canyon". A shoulder that is seven feet high with exposed tree roots marks the original level of the land. Persistant agriculture results in a continuing loss of soil each year. The farmer is now farming the subsoil but is able to grow crops through massive applications of fertilizer.

Questions To Explore:

A. WHERE DOES ALL THIS SOIL GO EACH YEAR?

Look at slope of land and trace the probable movement of soil particles during heavy rains.

Relate the erosion here to the landfill in the Mississippi Delta.

B. WHAT MIGHT THE FARMER DO WITH HIS FIELD TO KEEP IT FROM ERODING?

Discuss crop type and planting methods that would slow or stop erosion.

Could the farmer still make money with his land.

4. QUARTZ BOULDER

A quartz boulder estimated to weigh 1500 pounds is lying along the side of the trail where it begins to drop into the "Canyon". This rock has been washed free from the glacial till which comprises the surrounding landscape.

Questions To Explore:

A. IS THE BOULDER IN ITS PRESENT POSITION PROOF THAT EROSION IS STILL OCCURING IN THE UPPER LEVELS OF THE RAVINE?

Have the students look on the downhill side of the boulder; interpret and relate to boulder movement.

Age the boulder movement from available evidence.

5. MICRO-CLIMATES AND THE "GRAND CANYON"

The wind direction and speed, air temperature, and humidity are significantly different at the top of the ravine compared to conditions at the bottom, about 100 feet below.

Questions To Explore:

A. WHAT ARE THE ACTUAL DIFFERENCES IN WIND SPEED AND AIR TEMPERATURE BETWEEN THE TOP AND BOTTOM OF THE CANYON?

Have students measure (with instruments) each and compare.

Discuss the significance to the plant and animal community in the "Canyon".

B. ARE THERE ANY DIFFERENCES IN SOIL TEMPERATURE AND MOISTURE?

Have students measure shaded forest soil on the top and shaded forest soil on the bottom, with respect to temperature and moisture. Discuss the significance of the findings.

6. FOREST FLOOR

The forest floor has a rich variety of herbaceous perennials and ferns. Included are trillium, columbine, spring beauty, violets, hepatica, adderstongue, Dutchman's Breeches, meadowrue, and bloodroot. The ferns include Boston and Maidenhair.

An interesting primitive plant, the scouring rushes (Equisetum) grows in abundance along the trail.

Questions To Explore:

A. WHAT EVIDENCE OF SMALL ANIMAL LIFE CAN YOU FIND AMONG THE LEAVES AND PLANTS ON THE STEEP BANKS OF THE "CANYON"?

Look closely at a small portion of the forest floor on a steep bank.

B. LOOK CLOSELY AT ANOTHER PORTION OF THE FOREST FLOOR ON A STEEP BANK WHERE THERE IS VERY LITTLE COVERING THE SOIL. HOW IS THIS AREA DIFFERENT FROM THE FIRST AREA OBSERVED?

Encourage children to look for evidence of erosion where cover (both living and dead) is scarce. Relate small erosional features to their ultimate impact on the surrounding "Canyon".

7. STREAM IN THE VALLEY FLOOR

The small stream is still actively lowering the valley floor to the level of Cedar Creek into which the "Canyon" stream finally drains.

The stream flow is seasonal. The highest water levels occur in the spring. In the fall the stream slows to a trickle or may dry up. Some of the water carried by the stream seeps out of the ground as springs. The rest of the water comes from a small lake near the head of the "Canyon".

The stream harbors schools of small fish (stream minnows), crayfish, frogs, aquatic insect larva, and a host of small invertebrates living on the bottom.

Questions To Explore:

A. WHAT EVIDENCE CAN YOU FIND FOR THE CUTTING AND ERODING ACTION OF THE STREAM?

Have the children examine a section about 100 feet long. Look for gravel bars, exposed tree roots, and freshly cut or undercut banks.

B. HOW FAST IS THE STREAM DEEPENING THE VALLEY?

Speculate on the kinds of evidence that could be collected to answer this problem.

C. DOES THE STREAM DEEPEN THE VALLEY BY CUTTING STRAIGHT DOWN?

Develop the idea of meandering streams, outer bank cutting, and inner bank deposition. Relate miniature features by the stream to the larger "Canyon".

D. DOES THE STREAM CARRY DIFFERENT AMOUNTS OF WATER AT DIFFERENT TIMES OF THE YEAR?

Find some evidence for this by looking for drift materials caught above the present waterline and by looking for mud and watermarks on trees; also look for erosional deposits.

E. WHAT NATURAL EVENTS ARE OCCURING IN THE CANYON THAT SLOW DOWN THE EROSIONAL FORCE OF THE STREAM?

F. LOOKING AT THIS STREAM IN ITS PRESENT SETTING. UPON WHAT DOES IT DEPEND TO MAINTAIN ITS USEFULNESS AS A HABITAT FOR AQUATIC LIFE?

G. WHAT WOULD BE THE EFFECT ON CEDAR CREEK IF THE "CANYON" WERE LOGGED OVER OR BURNED?

Pick a spot along the stream where you can pour a bucket of water onto the bare soil with the runoff draining into the main current.

Discuss what effect a heavy runoff would have on the stream.

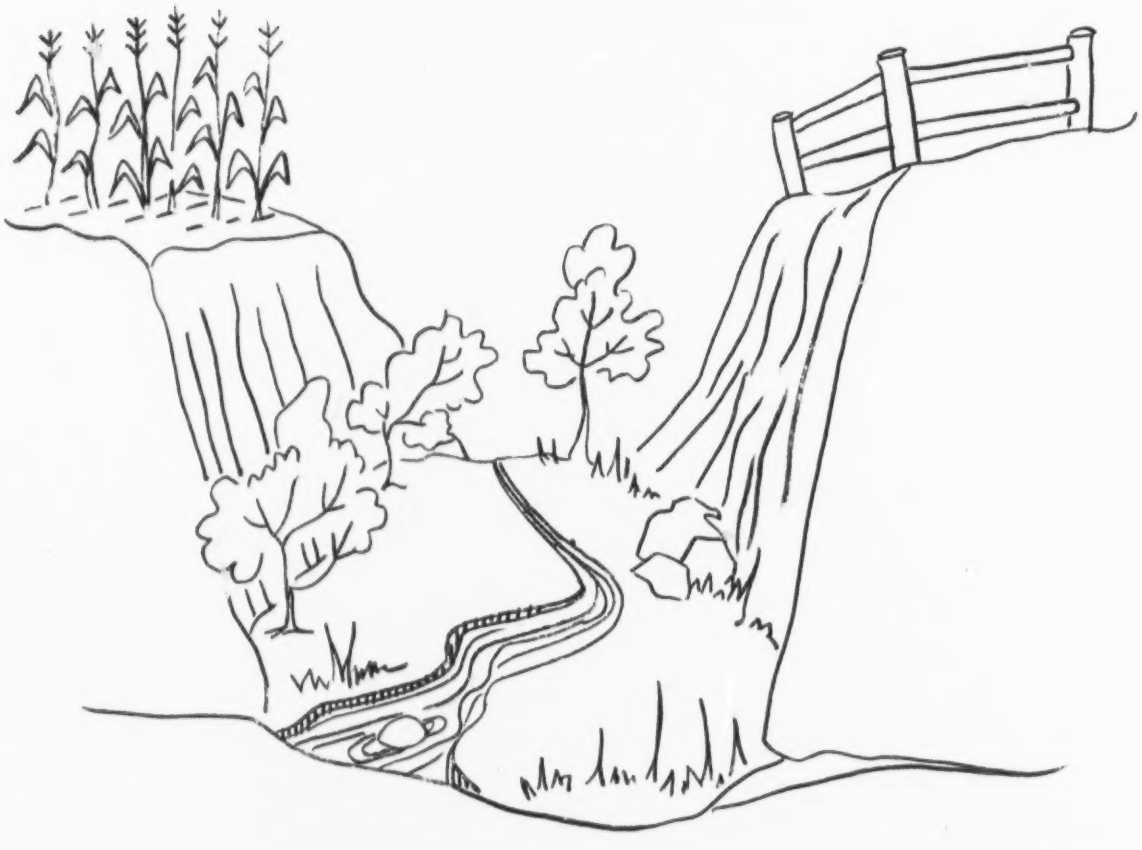
H. DOES THE VALLEY "CHANGE IN AGE" GEOLOGICALLY SPEAKING, AS YOU MOVE UPSTREAM?

Have students look at the general physical character of the valley, concentrating on the change from a broader flat-floored structure to a narrower V-shaped valley.

I. DOES THE "CANYON" PRESENT ANY THREAT TO THE SURROUNDING CROPLAND.

Have students examine the upper reaches of a younger erosion gully at the edge of a field. What evidence is there for danger to that field?

What would the farmer do to prevent the edges of his field from being lost to the "growing canyon"?



OBSERVING POND LIFE IN THE FALL-
THE FOOD CHAIN

A. ACTIVITY RATIONALE

Wetlands cover a substantial portion of the state of Michigan and are valuable as waterfowl breeding areas and natural water storage areas. In addition swampy areas provide cover and food for many larger animals including the white-tailed deer. The smaller life forms in marshy and swampy areas are an important part of the food chain that supports animal populations outside the immediate environs of the swamp.

It is important in this age of massive and extreme landfill and drainage projects for children to become aware of the usefulness of these important resources in maintaining desirable balances in the natural community.

This pond activity in the fall is designed to focus on the pond's location, surrounding topography and basin structure, explaining the origin and continuing existence of similar wetlands in southern Michigan.

The activity will also focus on the food web that exists in the water and along the shore through first-hand observations of existing plant and animal populations. A food pyramid will be constructed to show the effect of the pond community on animal populations nearby.

Man's impact on the pond through soil erosion and silting will be investigated by examining a drainage ditch carrying runoff water from surrounding croplands.

The effects, on food webs, of pond margin plant succession caused by cleared fields and pond margin invasions by human visitors will also be examined.

B. RECOMMENDED GRADE LEVEL

This activity is designed to be the second of two exploratory activities centering around the pond for Battle Creek students and is recommended for inclusion in the sixth grade.

This activity is applicable at either the fifth or sixth grade level for students from non-Battle Creek district schools and is recommended for inclusion in the fall program.

C. BACKGROUND INFORMATION FOR TEACHERS

Mystery Pond is a quiet body of water so shallow that rooted plants grow entirely across it. The water temperature is fairly uniform from top to bottom and tends to change with the air temperature. There is little wave action, and the bottom is covered with a muck-silt mixture about two feet deep. The muck is underlain by very hard clay that serves as a barrier to water loss into the sand below.

The swamp basin was originally created by landforms resulting from the Wisconsin Glacial Age which terminated in this area about 13,000 years ago. The number and kinds of plants and animals that make up the swamp community is continuously changing. This swamp started as a sandy-bottomed pond. Seeds of emergent aquatic plants along with zooplankton and phytoplankton spores were carried by the wind, water, or pond visiting animals to begin the plant life in the pond. These plant pioneers established the conditions necessary for small fishes, snails, mussels, caddisflies, mayflies, dragonflies, turtles, frogs, and other small invertebrate forms to make a living.

As the pond weeds became increasingly abundant, they contributed enough decaying matter on the pond bottom each year to begin building up the bottom. In addition many emergent plants began to grow outward from the shore as the water becomes shallower, contributing to the buildup of bottom debris.

Today emergent vegetation including cattails, buttonbush, and cowlilies cover the pond surface. In several spots red maple trees have established themselves in areas where the pond bottom is at the surface. Salamanders, frogs, and turtles are the dominant large invertebrates. Many aquatic insects, worms, crustaceans, and microscopic life forms live in the shallow weedy areas and on or in the muck bottom.

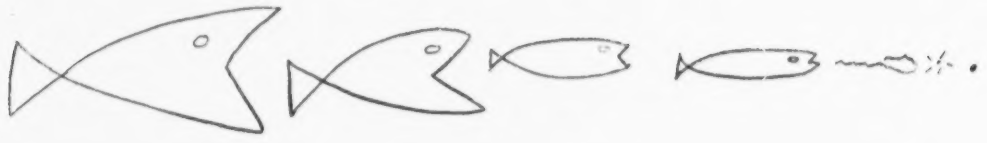
D. SEASONAL IMPLICATIONS FOR THIS ACTIVITY

Fall is an ideal season for exploration around the pond. There is a suitable hiking trail around the entire perimeter of the pond. Both the trail and the pond's edge remain quite dry during the entire fall season. Even on rainy days the area is easily accessable.

E. DESCRIPTION OF ACTIVITY

INDOOR ORIENTATION

1. Make a drawing:

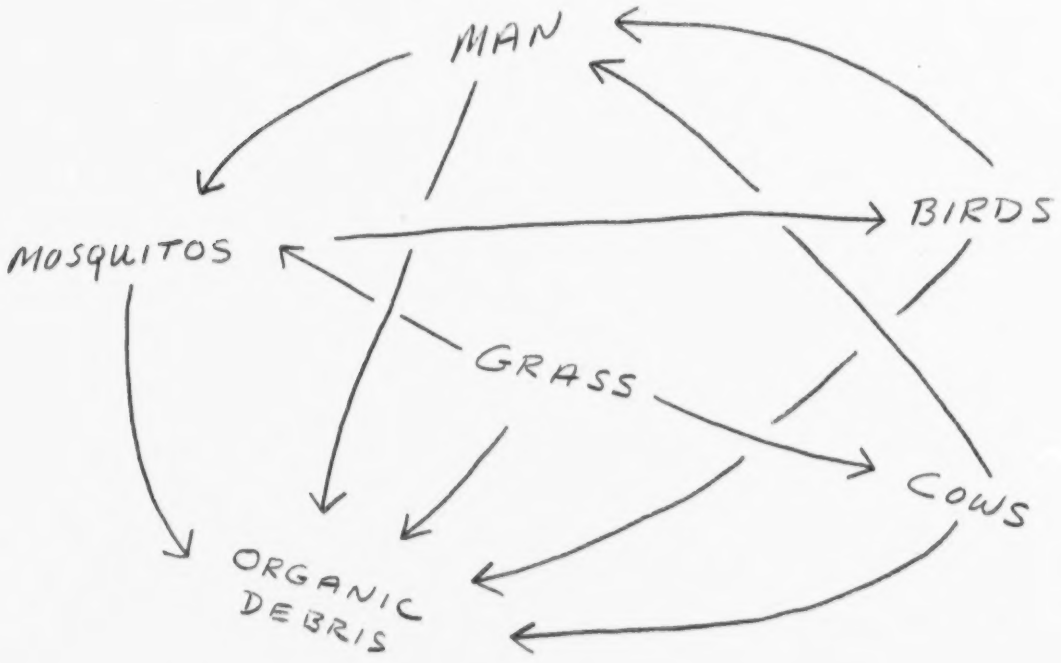


Ask students to tell what the drawing suggests.

2. Write the phrase food chain on the chalkboard and tell children they are going to explore some food chains in and around a large meadow pond community of plants and animals.

3. To develop the idea of a food chain, help the students create one that man is part of; sketch it on the chalkboard as ideas are contributed.

A sample chain might look like:



Ask students to identify the one living thing (in this diagram) upon which all the other living things in the chain depend.

Other chains may be developed; a complex food chain is usually called a food web.

4. Show students a transparency to illustrate a food web in the pond they will visit.

   Again ask students to identify the one living thing upon which all other living things in the food web depend.

5. Tell students the plant and animal community in the pond helps support a larger community outside the pond. Show the "pond associated" food web transparency or chart.

   Interpret chart by using analogy that relates human activities in Battle Creek to human activities in other parts of the country. What kind of interdependence exists?

6. Give each student two food web diagrams, one for the pond (see page F-50) and one for the pond environs (see page F-51).

   Tell children they are going to investigate a pond to look at some parts of the food web and also discover whether man has had any effect on the "webs" by his activities around the pond.

FIELD STUDY

1. Move the group to the top of "observatory hill". Ask students to observe the entire pond for a few seconds.

   Questions To Explore:

   a. IS THE POND DEEP OR SHALLOW?

      Use vegetation in the water as a clue, particularly the cow lilies and the red maples in the center of the pond.

b. IS ANYTHING VISIBLE FROM THE HILL THAT WOULD BE IMPORTANT IN THE RACCOON'S FOOD CHAIN?

Have the students examine their food chain chart and offer suggestions.

Tell them the soil under their feet contains very little of an ingredient that they will be looking for in the pond that is very important in the food web.

Have students look at their raccoon food chain chart to identify a material that is not living but appears to be important for several living things - organic debris.

Collect some soil from the hilltop and place it in a "shaker jar." Emphasize that the amount of organic debris in the hilltop soil will be very different from the amount the students will see in the pond.

2. Move the group to the pond's edge and have students collect a pond bottom sample for the shaker jar. Compare results with the hilltop.

Examine some of the muck. Ask students to look at the raccoon food chain chart and determine where the muck originated. Have them suggest some sources other than the plankton.

3. Tell the group they are going to move slowly towards the north end of the pond looking for evidence of the destruction of the important "organic debris" by an activity of man around the pond.

Have students examine the pond margin as they move north; discuss student suggestions.

4. If the group moves past the "sand delta" on the north end without recognizing its significance, bring the students back to that point for observation and discussion.

Questions To Explore:

a. WHY IS THE "DELTA" A THREAT TO THE POND COMMUNITY FOOD WEB?

Have students examine the delta; develop the idea of its growth out over the pond bottom, thus covering the organic debris making it unavailable for the food web.

b. HOW MUCH OF THE POND BOTTOM DEBRIS IS NOW UNAVAILABLE FOR THE FOOD WEB?

Have students examine the delta to determine the original pond shoreline prior to delta formation. Line students along the delta margin to emphasize the extent of the sand-silt fill.

The delta was first formed in 1967. Have students project the delta size when they are high school graduates and when they are 50 years old.

c. WHAT ARE SOME THINGS THAT COULD BE DONE TO SLOW DOWN OR STOP DELTA FORMATION?

Have students follow the drainage ditch to its apparent origin(s). Discuss any suggestions offered.

d. IN WHAT WAY HAS THE WATER RUNOFF FROM THE DRAINAGE DITCH BEEN HELPFUL TO THE POND COMMUNITY?

Call students' attention to the extensive growth of buttonbush (now dead) in the pond. Relate this growth to low pond levels in the past.

Have children look at their pond environs food web charts and suggest which animal types might be affected because of low pond levels and increased shrub growth.

5. Following an examination of the delta, tell students another factor affecting the pond food webs are "escapes and pioneer plants" growing along the pond margin.

Ask students for their definition of a "pioneer" or "escaped" plant.

6. Have students explore along the west side of the pond looking for some of these escapes.

One escape can be identified by its drooping branches, thick twigs, and round edible fruits.

Examine this plant (apple tree) and ask children to identify some animals in the pond environs food web

that might feed on this plant's fruit during the winter months.

What might be the effect on the pond food web of providing too much winter food for the muskrat colonies in the pond? Develop the idea of colonies getting too large for the regular spring and summer food supplies if large numbers are sustained over the winter by "unnatural" food.

7. Around the pond margin and in the water are numerous woody plants that support the total community:

Plant	Food Web Support
Black Willow	Organic debris
Bog Rosemary	Variety of birds
Buttonbush	Variety of birds
Leatherleaf	Rabbits and birds
Red Maple	Organic debris
Redosier Dogwood	Ruffed Grouse, Bob-white, deer
Swamp Rose	Variety of birds

8. Black willow, an important soil anchor, spreads rapidly around the pond due, in part, to the ease with which pieces of willow stem will send out roots and leaves.

   Have the class collect two or three woody twigs to take back to school to observe the rooting process in a jar of pond water.

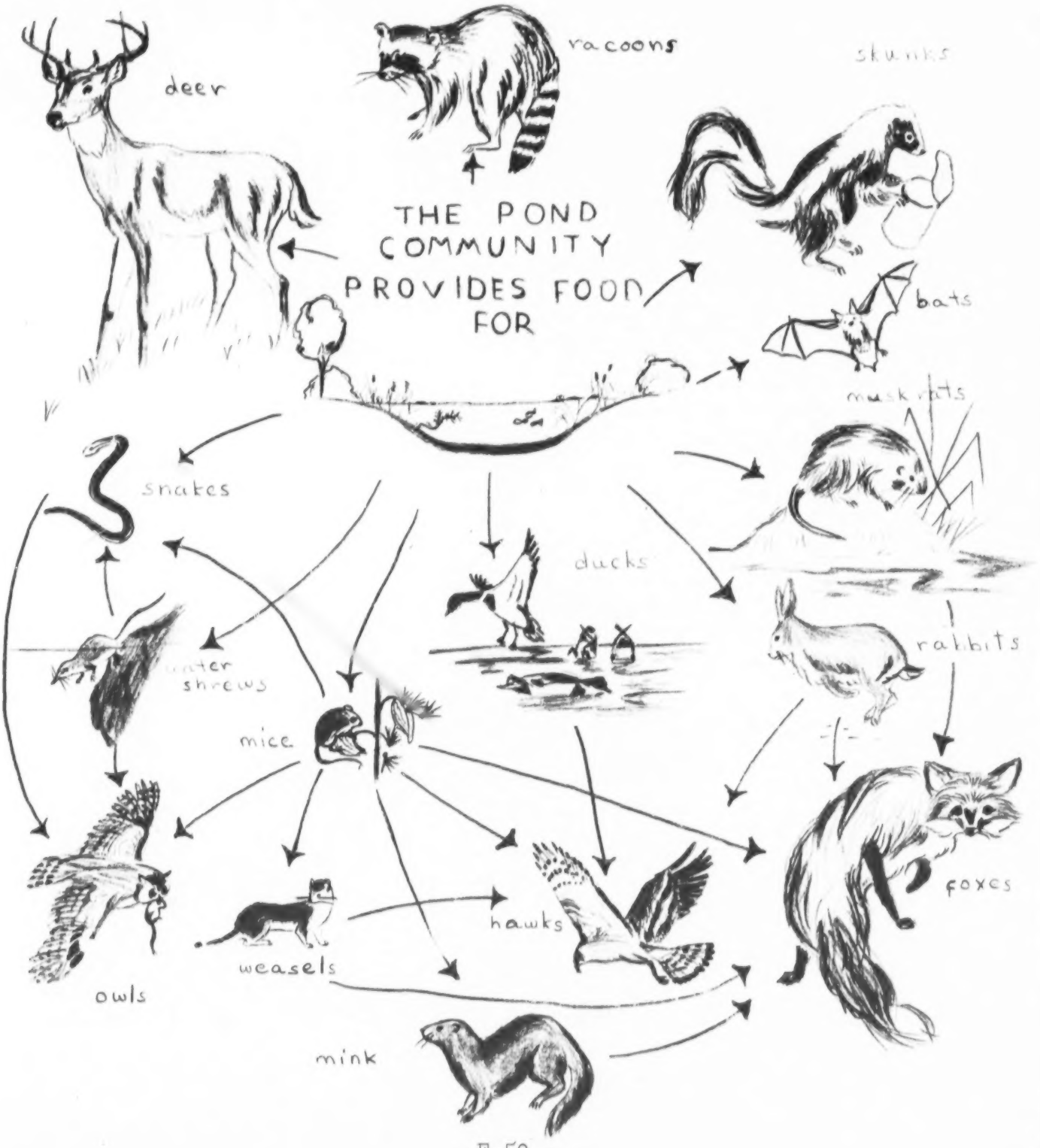
9. Move the students back to the top of Observatory Hill to again look at the total pond community.

   Discuss two questions:

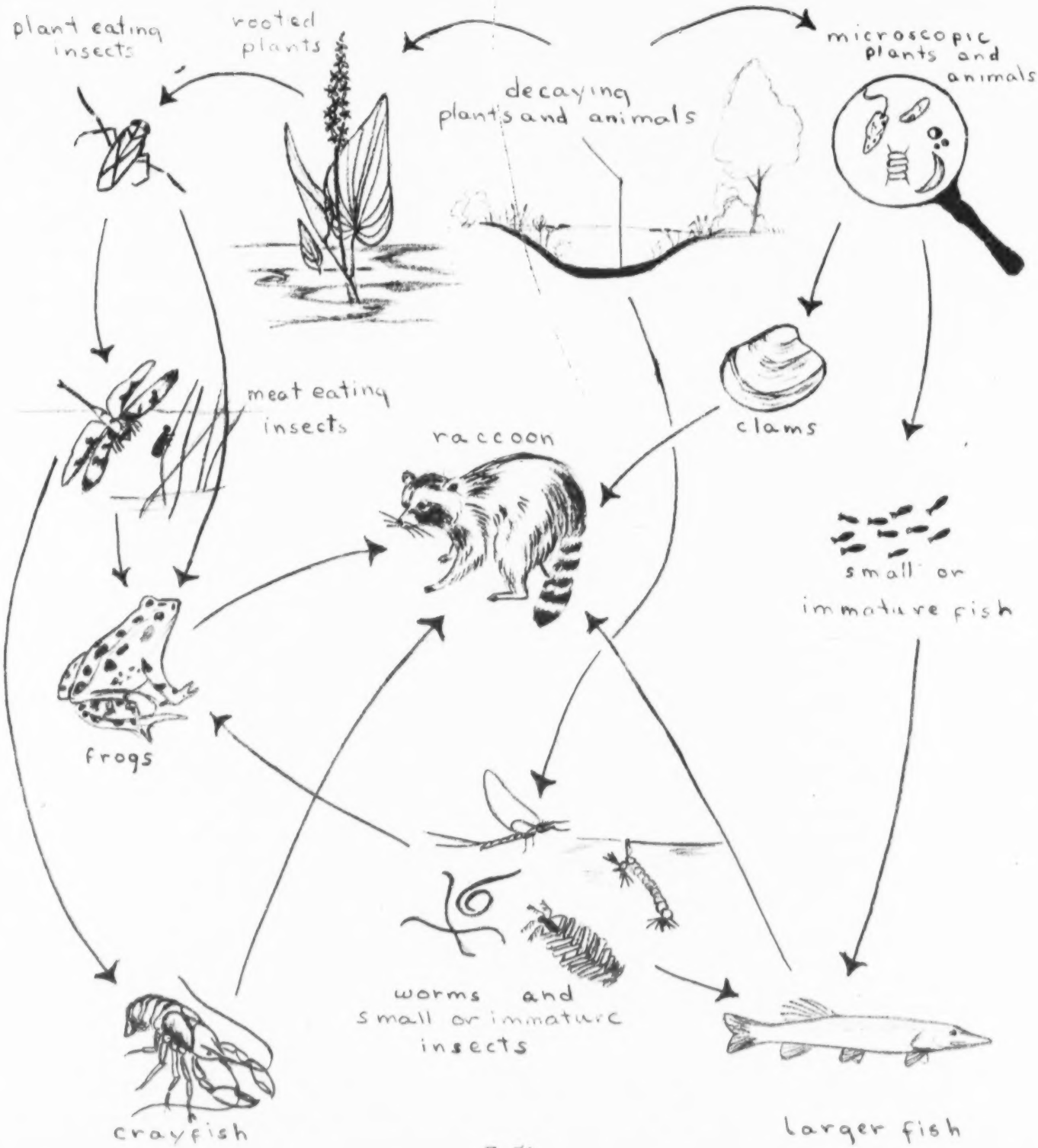
   Which side of the pond community - east, west, north, or south - offers the least amount of danger to the existing food web?

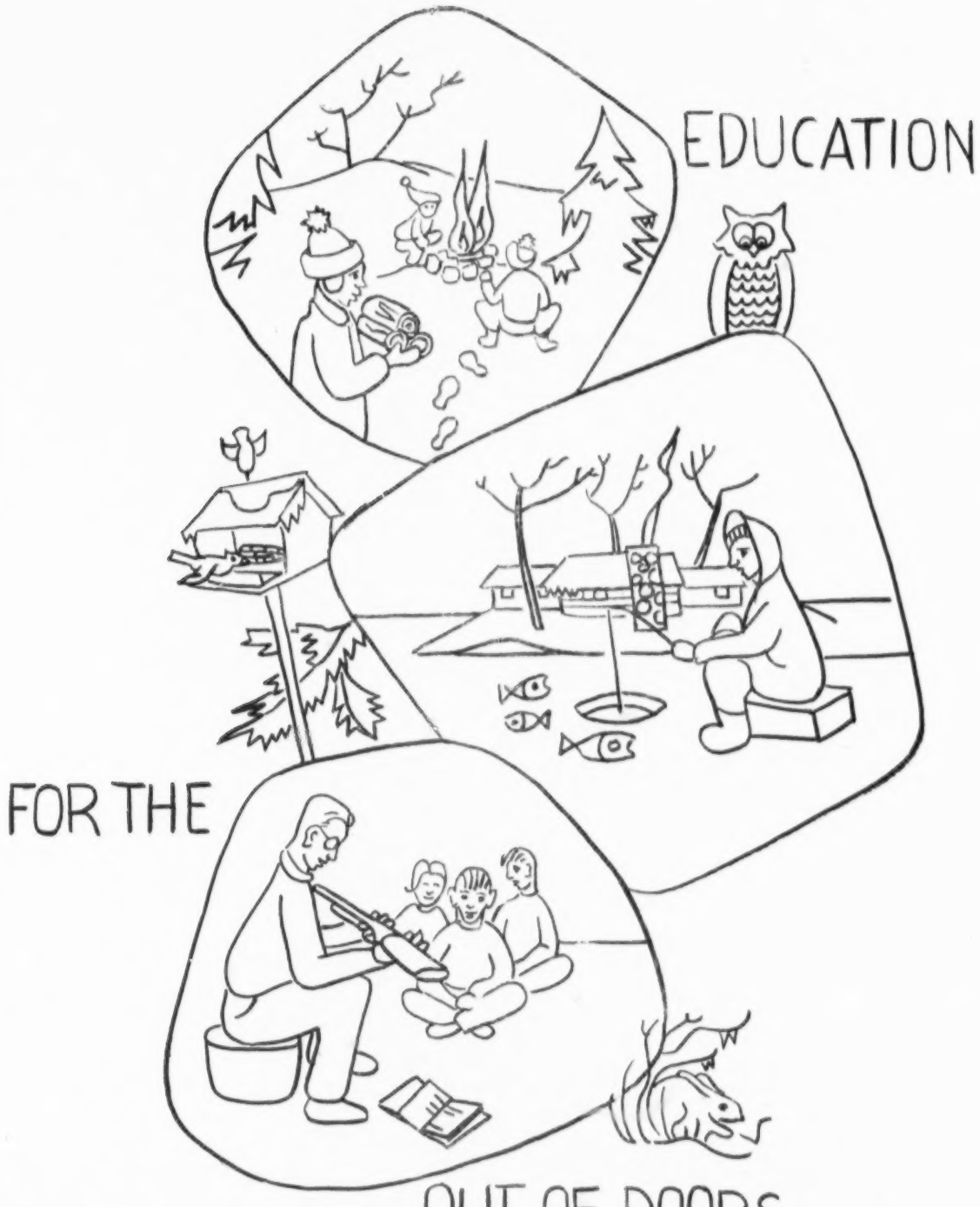
   Which half of the pond will most likely create a new food web in the next 100 years due to a changing habitat.

OTHER ANIMALS DEPEND UPON THE FOOD WEB IN THE POND



A RACCOON DEPENDS UPON THE FOOD WEB IN THE POND




EDUCATION
FOR THE
OUT OF DOORS

GUN SAFETY AND INTRODUCTORY MARKSMANSHIP

A. ACTIVITY RATIONALE

Children's attention is drawn to guns at an early age. At the upper elementary age the desire to play with harmless toy guns fades, and the desire to have the experience and thrill of using and handling real guns becomes evident. It is at this age that many children become the owner or user of a simple but real gun, the air rifle. The first instruction in the care and use of guns is recommended during elementary school age, and a good place to start is with the air rifle.

There are two major areas relative to the use of guns: shooting for developing a skill, i.e. marksmanship, and shooting in the field as a skill sport in pursuit of wildlife, i.e. hunting. Both of these areas demand knowledge of the proper use and handling of guns to ensure the safety of all individuals. Hunting safety is a topic of concern in many states every fall. Recognizing the need for knowledge of gun safety the Michigan legislature has passed legislation requiring minors to pass a gun safety course before they are issued hunting licenses in Michigan. The purpose of the legislation is to prevent accidents by young hunters.

The gun safety and marksmanship experience at the Outdoor School is designed to educate boys and girls in the proper use and handling of spring-type air rifles. It is also designed to introduce marksmanship as a skill sport which can be developed and pursued over a lifetime. In addition emphasis will be placed on introducing elementary techniques of gun handling while moving about in the field. This instructional program should provide, specifically, a good introductory background for those boys and girls who will maintain an interest in hunting during their teenage years and will be applying for hunting licenses.

B. RECOMMENDED GRADE LEVEL

This is an optional activity for non-Battle Creek district students only during the winter season.

Recognizing that the child's interest in guns intensifies as he grows older, this experience is recommended for sixth grade students.

C. BACKGROUND INFORMATION FOR TEACHERS

The outdoor school maintains an adequate outdoor range with ample equipment to permit participation by an entire class. Lightweight spring-type air rifles are employed. Official National Rifle Association targets and certificates are used for marksmanship instruction. Children who demonstrate marksmanship ability are presented appropriate award certificates as a reminder of their success.

Two main areas are used for instruction. Introduction to the guns and dry firing are taught inside the camp lodge. Live firing is taught on the outdoor range. All instructional techniques employed by the Outdoor School teaching staff are N.R.A. approved.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

The weather is the deciding factor on whether this activity is conducted on an indoor or outdoor range. On mild winter days, outdoor instruction can be conducted. However, whenever necessary, an indoor range for live firing can be set up and utilized.

E. DESCRIPTIVE OUTLINE OF THE ACTIVITY

1. Introduction

    a. General discussion of guns

        1. Parts
        2. How they work

    b. Demonstration of various kinds of guns

        1. Shotgun
        2. Rifle
        3. Handgun
        4. Air Rifle

2. Dry Firing Instruction

    a. Correct prone position and holding the gun
    b. Sight picture
    c. Trigger squeeze
    d. Firing line safety rules

3. Range Procedure Instruction

   a. Always point muzzle down range or angled up away from anyone else.
   b. Three students work together: firing position, cocking position, and shot caller.
   c. Commands

      1. Assume position (by range coach)
      2. Cock the guns
      3. Ready on the firing line
         Ready on the right
         Ready on the left

      4. Take aim
      5. Fire one round (three-five rounds)

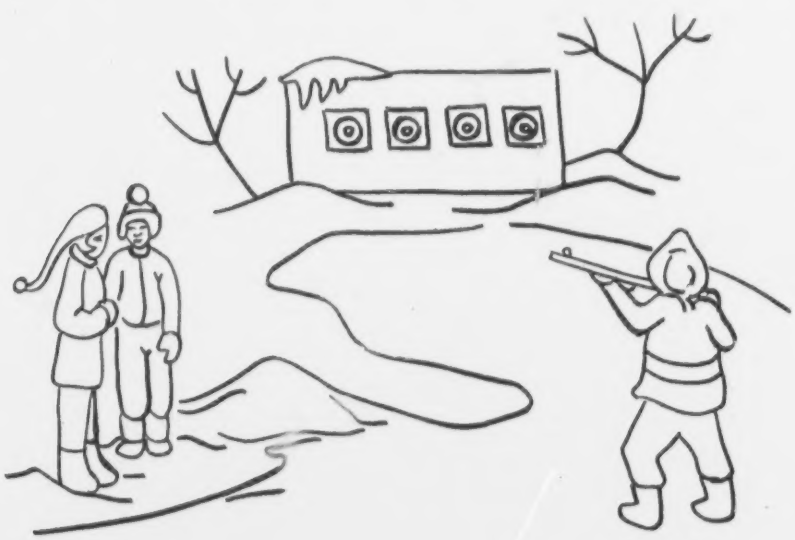
4. Range Firing

   a. Loading and unloading BBs
   b. Firing to command
   c. Replace targets for next person (on command only)

5. Shooting For Marksmanship

6. Safety Techniques In The Field

   a. Walking with an unloaded gun
   b. Walking with a loaded gun
   c. Crossing over a fence or stile with a gun
   d. Crossing through a fence with a loaded gun



ICE FISHING ON CLEAR LAKE

A. ACTIVITY RATIONALE

Fishing has always been a fascinating outdoor skill and recreational pursuit for many persons. Now that industrialization and urbanization have removed modern man from close contact with the land and waters, fishing appears to be becoming more popular as one form of outdoor recreation in which man can enjoyfully spend his ever increasing amount of free time.

Fishing is a skill that is easily adapted to learning by young children. As a child matures, he can continuously expand his knowledge and build new fishing skills. Thus, fishing as a skill has the potential for developing into a lifetime recreational pursuit.

Michigan as a state of many lakes and streams offers vast opportunity for a variety of fishing experiences. Michigan's cold winter climate has contributed to making fishing possible during the winter months as well as in the other seasons of the year. In recent years ice fishing has developed as a popular as well as challenging outdoor skill that can be pursued extensively during the winter months.

The ice fishing experience at the outdoor school is designed to introduce ice fishing to children as a winter skill sport which can be developed and pursued over a lifetime. The instructional program should provide an introductory background in the identification of the kinds of fish found in southern Michigan lakes, feeding habits of fish, and knowledge of the kinds of equipment and bait needed and their proper use. Emphasis should also be placed on the need for sound safety practices.

B. RECOMMENDED GRADE LEVEL

This activity is an optional winter activity for fifth grade Battle Creek students.

This activity is applicable at either the fifth or sixth grade level for students from non-Battle Creek district schools.

C. BACKGROUND INFORMATION FOR TEACHERS

A live display of the most common types of fish found in Clear Lake can be found in the Fish Room in the lodge. A collection of various types and sizes of hooks and lures are also on display.

Fishing is done in designated areas of Clear Lake. Holes are cut by the children. Cutting spuds are provided by the Outdoor School. Children may use their own equipment if they wish. However, the outdoor school provides ample equipment to permit participation by an entire class. Home-made poles complete with hook, line, and sinker are available for use

Bait such as wood grubs, goldenrod gall grubs, or corn borers can be gathered in the field. Other types of live bait can be purchased at the Trading Post. Cans for storing bait are also provided.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Sufficient ice on which to walk on Clear Lake is necessary to complete this activity. Normally the first ice cover appears on the lake late in November. Depending upon weather conditions, the lake is usually safe (an ice thickness of at least four inches) to walk on by mid-December. Ice fishing is usually possible anytime during January or February.

E. DESCRIPTIVE OUTLINE OF THE ACTIVITY

1. Indoor Orientation

   a. Discussion of Clear Lake

      1. Depth
      2. Temperature
      3. Plant growth
      4. Available food for fish in winter

   b. Discussion of fish in Clear Lake

      1. Types
         - Bleugills
         - Sunfish
         - Large mouthed bass
         - Bullhead
         - Perch
         - Pickerel
      2. Abundance

   c. Discussion of the parts of the fish and their function.

   d. Discussion of hooks and lures.

   e. Discussion of live baits.

2. Bait Gathering

3. Outdoor Demonstration

   a. Preparing a pole

      1. Placing the line on the pole
      2. Attaching the hook to the line
      3. Attaching the sinker to the line
      4. Attaching the bobber to the line
      5. Placing the bait on the hook

   b. Discussion of safety factors while on ice

   c. Spudding a hole

   d. Setting the pole

4. Ice Fishing in Clear Lake

5. Live Demonstration of Cleaning A Fish

6. Post Discussion

   a. Comparison of ice fishing to other methods of fishing
   b. Kinds of areas where one may ice fish
   c. Other kinds of equipment used in ice fishing
   d. Game laws, licenses, and fishing seasons
   e. Methods of cooking fish

ARTS AND CRAFTS USING NATIVE MATERIALS

A. ACTIVITY RATIONALE

Native materials are ideal for craft work, and they are readily available in the camp setting. Securing craft materials in their native environment may stimulate more creativity and be more relevant to the child than working with prepared materials in the classroom. The creative skills of native arts and crafts are valuable in instilling a feeling of self expression within the individual child as well as providing a feeling of self-accomplishment.

The arts and crafts experience at the outdoor school is designed to directly relate the child's artistic experiences with the out-of-doors. The outdoor environment is presented as a source of many available materials which can be utilized in creative craft projects. The primary focus of children working in the craft room is learning how to use some of the available native materials in this area in arts and crafts projects.

B. RECOMMENDED GRADE LEVEL

This activity is an optional winter activity for fifth grade Battle Creek students.

This activity is applicable at either the fifth or sixth grade level for students from non-Battle Creek district schools.

C. BACKGROUND INFORMATION FOR TEACHERS

The outdoor school maintains a craft room in the basement of the lodge. Examples of suggested projects are on display. Children gather native materials in the field before beginning a project. Children choosing to work with clay dig the clay in nearby farm fields. All supplemental materials needed for completing a project are available in the craft room. Tables, benches, and simple tools needed for carrying out the activity are also available. If a project is not completed in the time available, children are encouraged to take the project back to school or home for completion.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Since arts and crafts experiences at the Outdoor School focus on the use of native materials, winter activities are dependent upon the availability of materials. Clay is available in December only until the ground freezes. Materials for collages are available until heavy snows cover the ground. Wood is available throughout the winter, and the various kinds of wooden jewelry make excellent projects to pursue.

E. DESCRIPTIVE OUTLINE OF THE ACTIVITY

1. Orientation for the Activity

   a. Becoming acquainted with the facilities of the craft room.

   b. Reviewing the suggested projects that may be pursued.

      1. Clay
         medallions
         masks
         pots
         necklaces
         ear rings

      2. Collages

      3. Wooden jewelry
         ear rings
         medallions
         tikis
         rings

   c. Selecting a project

2. Gathering or selecting materials to be used.

3. Working on a project in the craft room.

COOKING OUT

A. ACTIVITY RATIONALE

Cooking an outdoor meal is a favorite outdoor activity enjoyed by thousands of American families. Building and cooking over the open fire demands more skill than home cooking and a deeper appreciation for outdoor living.

Although one person can successfully conduct his own cookout, this type of activity is more adaptable as a group activity in which each person assumes a role to fulfill to ensure a successful outcome.

The cookout experience at the outdoor school is designed to introduce the cookout to the student as a group activity which demands both needed skills as well as group interaction through teamwork. The activity focuses on the need for careful planning in selecting a site, determining a menu, and exercising safety precaution.

B. RECOMMENDED GRADE LEVEL

This activity is recommended for inclusion in the fifth grade program for Battle Creek students.

This activity is applicable at either the fifth or sixth grade level for students from non-Battle Creek district schools and is recommended for inclusion in the winter program.

C. BACKGROUND INFORMATION FOR TEACHERS

Children plan a menu for, carry out adequate preparation for, and eat, as a group, a well balanced meal which will fit into the total day's nutritional needs.

Many cookout sites are available in the camp area on both sides of the lake. Children choose a site in accordance with weather conditions and time available. Children ready the site for cooking and gather dead wood in the camp woods for firewood. Food is prepared and packed in the lodge. A supply room for cookout equipment is maintained in the basement of the lodge.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Winter is the most unique season for cooking out due to the possibility of poor weather. This, however, creates a challenge and the chance for a new and exciting experience. Cooking out, in winter therefore becomes a popular activity which is successfully pursued by classes throughout the winter.

E. DESCRIPTIVE OUTLINE OF THE ACTIVITY

1. Organizing for the Cookout

    a. Selecting a balanced menu

        1. meat
        2. vegetable
        3. salad
        4. beverage
        5. dessert

    b. Determining needed equipment
    c. Preparing the food
    d. Packing needed equipment

2. Choosing and preparing the site

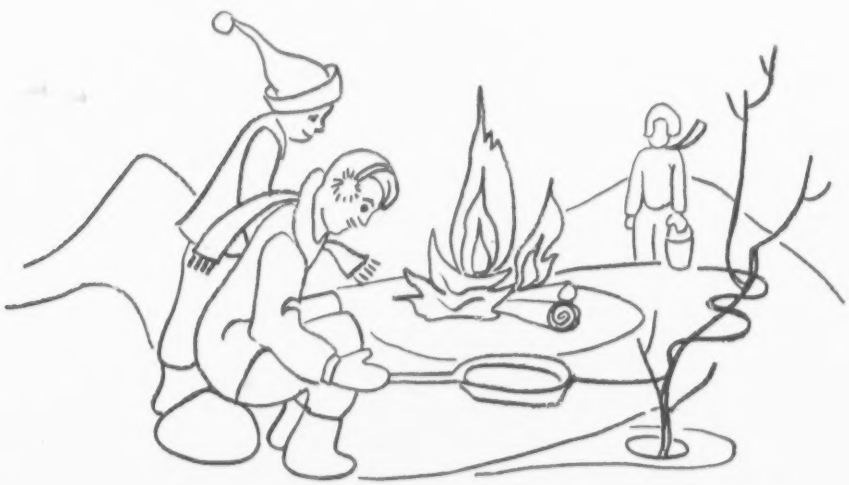
3. Cooking the meal

4. Cleaning up the site

5. Returning and cleaning up equipment

6. Post activity discussion at the Outdoor School

    a. How successful was the activity?
    b. How well did the class work together as a group?
    c. What skills are important for the success of the activity?



EDUCATION
IN THE
OUT OF DOORS

VISIT TO A DAIRY FARM

A. ACTIVITY RATIONALE

Dairy farming has long been one of the integral land uses in southern Michigan, and milk as a product is a prime example of man's dependence upon the land as a source of food for his existence. In earlier years dairy cattle production was a part of the operation of the "general" farm. However, in this era of specialization larger specialized dairy farms have emerged as a result of the gradual disappearance of the smaller "general" farms. The story of milk production is particularly fascinating to children who are the prime consumers of the product and its byproducts. This activity is designed to provide children with an understanding of all aspects of dairy farming and demonstrate the importance of the role that dairy farming plays in our lives.

B. RECOMMENDED GRADE LEVEL

This activity is recommended for inclusion in the fifth grade program for Battle Creek students. Out-of-district students may participate at either the fifth or sixth grade level.

C. BACKGROUND INFORMATION FOR TEACHERS

The dairy farm is located along M-37 about ½ mile south of the entrance road to the Outdoor Education Center. The entire acreage of the farm is devoted to the practice of modern dairy farming. The farmer maintains a herd of over 40 milking cows. Usually there are calves and young heifers in the barn.

The barn is large and is kept in clean condition providing an opportunity for children to view all the functions of the dairy farm. Hay is stored in the upper level of the barn; a modern silo filled with silage adjoins the building. Fresh milk is stored in a bulk cooler in a separate room along with automatic milking equipment.

Farm machinery is stored in adjacent buildings.

During the growing season the cows are pastured in some of the adjacent fields, while feed crops such as hay and corn are grown in other fields.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Dairy farming is a continual operation; however, routine daily activity is partially seasonal in nature. A visit to the farm during the winter season should also focus on the effects winter weather has on dairy farming and note the special preparations that were necessary for the season.

E. DESCRIPTION OF ACTIVITY

The following outline for the activity is suggested

1. Orientation at the Outdoor School

   a. Establish rationale for the visit
   b. Outline details of the hike
   c. Establish behavioral expectations while visiting the site

2. Explore the barn yard

   a. Observe cattle: number present, various ages, kind of cattle
   b. Observe feeding areas and kinds of food
   c. Discuss special physiological features of the cow (cud chewing, two stomachs, etc.)
   d. Observe the silo and its contents

3. Explore the lower level of the barn

   a. Observe young calves and their food
   b. Observe and identify the mechanized milking equipment
   c. Observe the stanchions, watering system, and feeding troughs
   d. Observe the milk room and the bulk cooling and storage tank

4. Explore the upper level of the barn

   a. Observe hay and hay storage area
   b. Observe ropes and pulleys for storing and removing hay
   c. Observe equipment stored here
   d. Observe other foods stored in the area

5. Note and determine use of other farm buildings

   a. Pole barn
   b. Tractor shed
   c. Tool shed

6. Explore adjacent farm fields and note land uses

   a. Fields used for pasture
   b. Fields where hay is grown
   c. Fields where grain crops are grown

7. Post activity discussion at the Outdoor School

   a. Effect of dairy farming on our lives
   b. Implications of mechanization to farming
   c. Different breeds of dairy cattle (illustrate with slides)
   d. How the various kinds of machinery operate (illustrate with slides)
   e. Importance of cleanliness in dairy farming
   f. How the seasons and weather affect dairy farming
   g. Transportation and marketing of milk (illustrate with slides)

VISIT TO A BEEF FARM

A. ACTIVITY RATIONALE

Beef cattle production is now an integral part of Michigan agriculture. Within recent years there has been a sharp increase in the number of Michigan farms specializing in beef cattle production and a corresponding sharp decline in the number of "general" farms which were once more characteristic of rural areas. Despite this change man, who now exists primarily in an urban environment, is even more dependent upon this phase of agriculture for his existence. This activity is designed to acquaint children with an operation as it exists on a typical southern Michigan farm and indicate its relationship to man's dependence upon the land for his own existence.

B. SUGGESTED GRADE LEVEL

This is an optional activity for non-Battle Creek district students only during the winter season; it is applicable at either the fifth or sixth grade level.

C. BACKGROUND INFORMATION FOR TEACHERS

The beef farm is located along M-37 adjoining the boundary of the Outdoor Education Center. The farm extends over 600 acres in separated parcels of land on both sides of Clear Lake. The farm buildings have been converted from a "general" farm into a highly specialized operation.

During the later part of the fall season the farmer buys young calves to raise and market when ready for slaughter. There are usually about 125 head in the herd. The cattle are usually kept about one year, being marketed early in the fall season.

Much of the feed for the animals is raised on the farm. Corn is cut as Silage and stored in the silo. Hay is stored in the barn.

The cattle are housed in the lower part of the barn and in adjacent pens. During the fall season the young stock often graze over harvested fields. During the winter season they are confined to the barn and the barnyard.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Weather is not a factor; the farm may be visited anytime. During the winter season the cattle will be young and usually are confined to pens in the barnyard area which affords easy viewing.

E. DESCRIPTIVE OUTLINE OF THE ACTIVITY

1. Orientation to the Activity

   a. What are beef cattle?
      1. various breeds
      2. relationship to man's existence

   b. What is a specialized farm?

2. Hiking to the Farm

3. Observing the Cattle

4. Observing the Buildings and Pens

   a. Types of feed grains stored
   b. Other types of feed stored
   c. The silos
   d. Shelter for animals
   e. Equipment sheds and stored machinery

5. Observing Nearby Fields

   a. Apparent use
   b. Estimating the acreage
   c. Examining the soil and topography and its effect on the farm operation

6. Post Activity Discussion at the Outdoor School

   a. Implications of mechanization to this type of farming.
   b. Beef cattle, what a year of their life is like
      1. feeding methods
      2. meat production

   c. Evidence of good and poor farming practices
   d. Relationship of this type of farming to the seasons and weather
   e. Transportation and marketing of stock
   f. The government and farming
   g. Importance to man of this type of farming

PREHISTORIC LIFE IN MICHIGAN-
A FOSSIL DIG IN BARRY COUNTY

A. ACTIVITY RATIONALE

Man's place, historically speaking, in the whole development scheme of the planet on which he lives, has always been a fascinating subject to explore.

Within recent years, the geological sciences have made tremendous contributions to our knowledge of the development of life on earth over the last two billion years.

Elementary children have already been "tuned in" to some of this knowledge as evidenced by their universal interest in dinosaurs, etc.

The "Fossil Dig" experience at the Outdoor School is designed to broaden the students' concept of "life in the past" through a combination of laboratory and field work with invertebrate fossils that can be found in Barry County.

B. RECOMMENDED GRADE LEVEL

This is an optional activity for non-Battle Creek district students only during the winter season; it is applicable at either the fifth or sixth grade level.

C. BACKGROUND INFORMATION FOR TEACHERS

During the last 500 million years, Michigan has been covered several times by ancient seas. The sea bottom during each period of indunation served as a collecting surface and agency for the preservation, through fossilation, of many of the now extinct life forms that lived in the warm shallow seas of those past geologic periods.

After the seas disappeared for the last time, about 240 million years ago, the great limestone, sandstone and shale beds, formerly sea bottom material and now solid bedrock, were exposed to the air. During the millions of years that followed, these rock beds were eroded, layer by layer, freeing and destroying the enclosed fossil remains along with the rock into the Michigan landscape as it appeared about one million years ago.

At that time, a new erosive force developed--the first of four great ice sheets swept down from the north tearing off large amounts of the ancient sea bottom bedrock. As this bedrock material was carried south by the ice and glacial meltwater, the large pieces were worked into increasingly smaller pieces. A heterogeneous mixture of sand, gravel and clay was finally produced and eventually spread over the entire state as the last ice sheet retreated back to the north about 10,000 years ago.

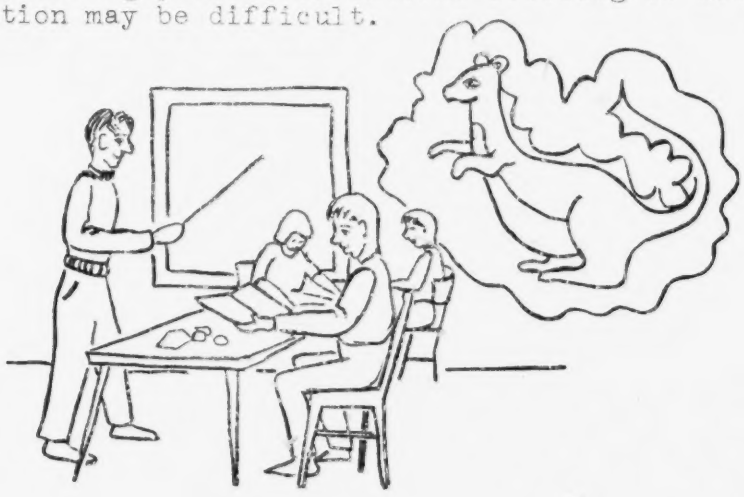
We find fragments of fossil remains in this glacial till freed from the original bedrock layers that preserved them millions of years earlier.

The glacial till covers the lower peninsula of Michigan to an average depth of 150 feet and contains rock, mineral and fossil representatives from many geologic periods spanning hundreds of millions of years.

Students will have an opportunity to make some first-hand observations on the fossils contained in the glacial till as they go on a "Fossil Dig" in a gravel pit near Clear Lake.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Winter is the most challenging season for exploration in a gravel pit. The possibility of finding interesting specimens varies greatly with weather conditions. During mild spells when there is little of no snow cover, exploration is usually easy. Howver, during periods of extreme freezing or heavy snows exploration may be difficult.



FOR THE OUTDOOR SCHOOL TEACHER

E. DESCRIPTION OF ACTIVITY

ROCK LAB ORIENTATION

1. Use nautiloid fossil as a "mystery rock found in a creek bottom" to introduce activity - create complete drawing of nautiloid specimen as children try to match drawing with geologic period pictures on the Rock Lab time line.

2. Discuss time line - extend line back to hypothetical beginning of the earth (8 times around the room).

3. Use transparency CID 21 - have children match pictures on visual with geologic time period on time line. Point out the rise and fall of animal groups.

4. Develop idea that the time line animal and plant information was constructed on the basis of fossil evidence found in the rocks of different ages--show several fossils--emphasize fragmentary nature.

5. Use transparency CID 22 to show that whole animals are not always found--parts indicated are most commonly found.

6. Let children have some experience with some fossils they can hold--distribute green boxes, one box per two children. Let students examine specimens for a moment.

7. Now ask class to examine their individual specimens and in timed intervals have them do the following:

   a. count the number of fossils on their hand specimen.
   b. count the <u>different</u> kinds of fossils on their hand specimen.
   c. match any fossil on their hand specimen with a geologic period on time chart.

8. Students should now be interested in searching the glacial till for some fossils they can find themselves.

9. Suggest that, before they go on a "Fossil Dig" near Clear Lake, they should know whether or not any ancient seas covered Michigan to produce some fossil beds.

Show filmstrip "The Story Fossil's Tell" frame #25 and 26---pictures areas of North America covered by ancient seas.

10. Organize for field work--each child should bring back 4 or 5 hand specimens for examining in the Rock Lab. In addition, each team should have a rock hammer and collecting satchel or box and a pocket magnifier.

FIELD STUDY

1. Organize students by teams--cover ground rules for safe behavior in pit--encourage a lot of exploratory activity.

2. Do not discuss rock types with students--this is a "fossil dig"--keep students thinking fossils.

3. Each time a student finds a fossil, announce the find to the rest of the class to encourage greater activity.

4. Teacher should not pass judgment in the field on whether or not rocks shown by the students are fossils--this judgment is to be made back in the lab. General encouragement should be given to take back all "suspect rocks".

ROCK LAB FOLLOWUP

1. Have children use (10%) <u>acid</u> <u>test</u> to begin fossil identification procedures.

   a. Divide specimens into two groups:
      Group 1. rocks that fizz (bubble)
      Group 2. rocks that do not fizz (bubble)
   b. Examine group 1 rocks very carefully---compare any shapes or patterns on the specimens with fossil identification book. pp. 81-132

2. Children that do not have any group 1 rocks can examine the rock lab fossil bucket.

F. SUGGESTED CLASSROOM ORIENTATION ACTIVITIES (PRE-OUTDOOR SCHOOL)

Activity One - Recognizing A Fossil In A Rock

1. Obtain traveling fossil collection from the Kingman Museum (te. 5-5715).

2. Have students look at some of the specimens to determine the following:

   a. Is the fossil a cast, print or original animal?
   b. Which part of the animal is visible: the shell skeleton, teeth, or other parts?
   c. Is the fossil complete or only part of the animal or plant?
   d. Is the fossil made of the same kind of material as the rock in which it is found?

Activity Two - How Fossils are Formed

1. Obtain "Fossils Filmstrip-Record" from A-V Department (tel. Ext. 231) and use filmstrip 10951 C SD.

2. By using the filmstrip, the teacher will be able to provide students with information on the following:

   a. Identification of a fossil.
   b. Conditions necessary for fossilization to occur.
   c. Why most organisms do not become fossils.

G. SUGGESTED CLASSROOM FOLLOWUP ACTIVITIES (POST-OUTDOOR SCHOOL)

Activity One - Filmstrip Viewing and Discussion for More Information on Fossils

1. Additional information you may wish to develop about fossils:

   a. How fossils are formed.
   b. Fossils and organic change.
   c. Fossils and prehistoric environments.
   d. Collecting and interpreting fossils.

2. To develop this information, use the "Fossils" filmstrip available from the A-V Department (tel. Ext. 231)

H. GENERAL BIBIOGRAPHY OF LOCAL MATERIALS

1. Audio-Visual (tel. 962-5581, Ext. 231)

   a. Age of Mammals (fs)
   b. Beginning of Life (fs)
   c. Coming of Reptiles (fs)
   d. Dinosaur Age (F)
   e. Discovering Fossils (fs)
   f. Fossils are Interesting (F)
   g. Rise of Dinosaurs (fs)
   h. Stories Fossils Tell (fs)
   i. Triumph of Dinosaurs (fs)

2. Books - School Services Department, Willard Library

   a. They Turned to Stone
   b. Wonders of Fossils
   c. Fossils
   d. The Real Book About Prehistoric Life
   e. The Age of Reptiles
   f. All About Dinosaurs
   g. All About Strange Beasts of the Past
   h. Dinosaurs
   i. Discovering Dinosaurs
   j. Famous Fossil Finds
   k. The True Book of Dinosaurs
   l. Prehistoric World
   m. Life Through the Ages
   n. Monsters of Old Los Angeles
   o. Animals of Yesteryear
   p. What is a Dinosaur

DISCOVERING MICHIGAN ROCKS

A. ACTIVITY RATIONALE

Rocks have always been an important part of man's environment. The soil contains rock particles; the mountains are made of solid rock; and sanddunes and seashores are collections of rock grains. The city streets and buildings use rocks in the glass, concrete, asphalt, bricks, and other materials used in building modern cities.

We sprinkle rocks (salt) on our food, brush our teeth with rocks (diatomaceous earth), and even wear rocks (jewelry and specialized clothing).

The "Discovering Michigan Rocks" activity at the Outdoor School is designed to broaden the student's ideas about the varieties of Michigan rocks, their characteristics, where they come from, and how they are useful to man.

B. RECOMMENDED GRADE LEVEL

This activity is designed to be the first of two exploratory experiences in geology for Battle Creek students and is recommended for inclusion in the fifth grade program.

This activity is applicable at either the fifth or sixth grade level for students from non-Battle Creek district schools.

C. BACKGROUND INFORMATION FOR TEACHERS

The earth is essentially a "ball of rock", covered with a relatively thin layer of clay, sand, silt, gravel, boulders, organic debris, and other materials in all kinds of mixtures. This thin layer covers about 3/4 of the earth's surface.

All of these materials came originally from the "solid rock" of our planet. Running water, gravity, wind, freezing and thawing, chemical weathering, volcanic activity, earthquakes and glaciers are some of the geologic processes that remove rock from the "original ball" to form the thin surface layer we live on.

In addition to the forces that remove rock from the original "solid ball", other geologic processes are at work that create "new rock" on top of the original rock. These rocks are usually formed as small rock particles and are dropped to the bottom of bodies of water in the form of mud, sand, or minerals leaving the water.

Rocks that are formed in the interior of the earth at high temperature or from molted materials, are called IGNEOUS ROCKS. Igneous rocks that move towards the surface but harden before they get there are often associated with metal ores. Common rocks and minerals in this category are granite, feldspar, mica, quartz, pegmatites, syenite, diorite, and gabbro.

Igneous rocks that break out at the surface in the form of lava from fissures and volcanos are commonly represented by rhyolite, obsidian, pumice, andesite scoria, and basalt. Basalt is common in Michigan particularly in the western end of the upper peninsula.

Rocks that are formed by the action of wind and water or organic agents are called SEDIMENTARY ROCKS. These rocks are formed as the original igneous rocks are reworked. Examples would be limestones, shales, coal beds, sandstones, salt beds, conglomerates, concretions, breccias, and bog iron ores.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Winter is the most challenging season for exploration in a gravel pit. The possibility of finding interesting specimens varies greatly with weather conditions. During mild spells when there is little or no snow cover, exploration is usually easy. However, during periods of extreme freezing or heavy snows exploration may be difficult.

FOR THE OUTDOOR SCHOOL TEACHER

E. DESCRIPTION OF ACTIVITY

ROCK LAB ORIENTATION

1. Draw a 4' diameter circle on the board. Tell students this represents a rocky ball called earth. Have several students make a mark on the ball to show how deep they think man has explored.

2. Show students actual depth of penetration ---- make a barely visible mark with a piece of chalk to represent the deepest oil well. Discuss our lack of knowledge, from direct observation, of most of the rocks of the earth.

3. Show students a piece of rock (granite). Tell them this rock was found laying on the outer thin layer of the earth; have them guess its age in years.

   Compare with: the turn of the century
   the landing of the Pilgrims
   the birth of Christ
   the age of Dinosaurs
   etc.

   Have students put some numbers on the board they think represents the age of rock.

   Write the actual minimal age of the rock (in excess of 1,000,000,000 years) on the board and use an analogy to illustrate the length of a billion years period of time in terms students can understand.

   Tell students we can not only tell how old rocks are by looking at them, but we can also tell where they came from and how they were formed.

4. Pass out a collection of rocks (sandstone, limestone, granite, gneiss, basalt, and quartz) to every two students.

   Tell students they, too, can begin to learn to "read the story" a rock can tell, by looking at their own samples---hold up a piece of gneiss---have each student team select the same piece and tell you all they can observe in a few seconds.

Try the same thing with the quartz speciman---develop the notion that rocks with only one color probably have just one chemical in them and are called minerals. Rocks that have more than one color probably have a mineral (chemical) for each color and are called rocks.

Have students separate the rocks from the minerals in their sample collection.

5. Tell students at least two of their rock samples came from the ocean bottom, one came from the molted interior of the earth, and one poured out of a volcano.

   To illustrate this show transparency CID-17.

   Relate the characteristics of the student's samples to the visual presentation.

6. Tell the students they are going to take a geology trip 40' down into the surface of Barry county to look at the rocks.

   The object of the trip will be to collect and look at enough rocks to determine how or where the rocks of Michigan were made.

7. Put the following words on the board----volcano, ocean bottom, earth's interior, beach, stream bottom, etc. Have class predict which kind of place, the rocks they will find, were formed.

8. Organize for field work---each child should bring back 4 or 5 hand specimens for examining in the rock lab. In addition, each team should have the following in the field; a rock hammer, a collecting bag, a pocket magnifier, and a field guide sheet.

FIELD STUDY

1. Organize students by teams----cover ground rules for safe behavior in pit. Encourage a lot of exploratory activity.

2. Do not discuss fossils with students----this is a "rock hunt"---keep students thinking rocks and their origins.

3. Each time a student names a rock or its origin, announce the find to the rest of the class to encourage greater activity.

4. Teacher should not pass judgment in the field on whether or not the rocks shown by the students are correctly identified. General encouragement should be given to take back all "suspect" rocks.

5. Give each student a copy of the Rock Field Guide (see page W-27) to aid in identifying the names of some of the common igneous and metamorphic rocks.

ROCK LAB FOLLOWUP

1. Give one rock test kit and one rock manual to each student team.

   Proceed with directions for using manuals and test kits.

2. Discuss results with students as they investigate in terms of identifying rocks by their colors, hardness, streak, and dissolving power; place emphasis on observation and testing rather than finding the "right answer".

3. Encourage students to use the electric board to check real specimens for rock names and origins.

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"Discovering Michigan Rocks"

A ROCK FIELD GUIDE

If your rock is very hard, light-colored, dark colored or has several colors, or has many tiny crystal grains, IT IS PROBABLY AN IGNEOUS ROCK:

If your rock is soft to medium hard, one color, or if it looks like a mass of pebbles, IT IS PROBABLY A SEDIMENTARY ROCK:

IGNEOUS ROCKS

Formed deep in the earth's interior

OR

Formed from the action of volcanos

Example	Description
Granite	Light-colored, three kinds of minerals
Syenite	Same as granite, but no quartz mineral present
Rhyolite	Light-colored, very tiny crystals, not very heavy
Gabbro	Dark-colored, heavy very tough and hard
Basalt	Black, sometimes greenish, very heavy

SEDIMENTARY ROCKS

Formed from other rocks and formerly living things on the earth's surface by wind and water.

Example	Description
Limestone	White to gray color, fairly soft; smells like mud when wet
Shale	Dark gray, in layers that split; smells like mud when wet
Sandstone	Can be any color, feels sandy
Conglomerate	Many pebbles held together by rock cement
Concretion	A ball-shaped rock; rings around rings inside when broken open

DROP-OFF HIKE

A. ACTIVITY RATIONALE

An interesting problem situation which provides an excellent climate for teaching certain meaningful concepts is "being lost". "Being lost" is generally accepted as a common problem which one might expect to encounter. Although road maps are readily available for use while traveling, many persons lack skill in properly using them. Also, many persons fail to recognize the need for discovering available clues to be used as a means of problem solving when one "is lost".

The approach to instruction centering around appropriate uses of the road map and compass should be a problem solving approach in which the students are actively involved. For the most effective instruction they should be faced with the need to solve the problem.

The Drop-off Hike is designed to provide children with a simulated experience of being lost. They must treat the experience as a problem to be solved collectively by a small group of students through the process of gathering data as they use available equipment (maps and compasses) and observe available clues.

B. RECOMMENDED GRADE LEVEL

This activity is designed to be the first of two experiences involving instruction in the use of the compass. It is recommended for inclusion in the fifth grade program for Battle Creek students. Out-of-district students may participate at either the fifth or sixth grade level.

C. BACKGROUND INFORMATION FOR TEACHERS

With the aid of compasses and county road maps the children attempt to find their way back to Clear Lake from an unknown point several miles distant from the camp area. In preparation for and execution of the activity the following format is usually followed:

1. In an outdoor school classroom the outdoor school teacher conducts an orientation which acquaints children with the purpose of the

activity, the procedure to be followed, and the correct methods of using a map and a compass.

2. The children are divided into small groups for the hike with either a teacher or counselor being assigned to accompany each group.

3. Each group of children is transported away from the camp area by bus and is "dropped off" at a different point.

4. Utilizing newly acquired skills each group attempts to solve the basic problem at hand, i.e. finding their way back to camp.

Compasses, clipboards, pencils, and printed materials are provided by the Outdoor School.

Most groups of children successfully complete the activity by hiking back to the camp area. Those groups which are not able to successfully locate themselves and hike back within the allotted time period are transported back to the camp area.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Drop-off hikes can be conducted anytime throughout the winter except during inclement weather when roads are impassable or the temperature is severely cold.

E. DESCRIPTIVE OUTLINE OF THE ACTIVITY

1. Orientation for the Activity

   a. Discuss the purpose of the activity

      1. Describe the activity to the children.
      2. Have children realize that "being lost" is a problem.
      3. Have children realize that the problem can be solved.
      4. Have children realize the importance of the map and compass in solving the problem.

b. Divide the students into small groups.

c. How to use a compass

1. We are using a Silva compass with a "direction of travel" indicator.

2. The compass has a magnetized needle, the tip of which is painted red.

3. The needle is normally attracted to ("points to") the north by the earth's magnetism.

4. In order to achieve an accurate reading the compass should be held level.

5. The compass should not be used near other objects which are highly magnetized such as telephone and electric wires.

6. Distribute compasses to children for practice usage.

7. To orient the compass and find north: hold the compass level until the needle stops rotating; then rotate the housing until the letter N on top of the housing coincides with the red tip of the needle.

8. To discover other directions: hold the compass level with the needle and the letter N on the housing pointing to the north; the other letters on top of the housing now point to the three remaining major directions (east, south, west).

9. To find the direction of specific points (for example, the directions that a road runs): face the point or object with the plastic "direction of travel" arrow pointing toward it; turn the compass housing until the red end of the magnetic needle points to the letter N on the housing; the "direction of travel" arrow now coincides with the actual direction you are facing.

10. To find a predetermined direction for example - WEST, using a Silva compass: set the needle housing so that the letter W coincides with the "direction of travel" arrow; hold the compass with the "direction of travel" arrow pointing straight in front of you; turn on your feet until the red end of the magnetic needle coincides with the letter N on the housing. At this point you are facing the desired direction, WEST.

d. How to Use A Road Map

1. The top of the map is North unless indicated otherwise on the map.

2. The map has a legend which indicates the symbols used to represent various types of roads and features shown on the map.

3. The map has a scale of miles which indicates in inches the amount of space represented on the map by one mile.

4. Natural features such as lakes and streams are shown on the map.

e. Distribute a map to each group.

f. Have the students locate Clear Lake.

g. Have the students spot the location of the camp and determine the direction of the camp from highway M-37.

h. Realizing that they will be dropped off within four miles from the camp, have the students use the scale of miles and determine on the map the approximate area in which they will be hiking.

i. Have the students check the legend and determine the kinds of roads that exist within the four mile radius of Clear Lake.

j. Have the students look for symbols on the map within the four mile radius and check the legend to discover their meaning.

k. Describe a theoretical "drop-off" point in detail and have the students attempt to locate the point on their maps.

l. Tell children they are now adequately prepared to venture into the field and "become lost".

m. Remind the children that they, not the adult accompanying them, are expected to make the decisions necessary for solving the problem and returning safely to camp.

n. Review the rules to be followed (see page W-33).

o. Explain to the students that when they return to camp they are expected to summarize their progress (see page W-36).

2. Performing the Activity

a. Each group of children is taken by bus to their drop-off point.

b. Students make observations and decisions in their small groups and begin hiking back to camp.

c. The adult supervisor provides the necessary guidance (see page W-34).

3. Post-hike Activity

a. As each group returns to the outdoor school classroom they should be given a summary sheet to complete.

b. Whenever time is available, each group should be given the opportunity to summarize verbally for the rest of the class the success of the activity.

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Rules For Hiking - Drop-off Hike

1. The group must stay together in single file.

2. You should hike on the left side of the road, facing oncoming traffic; hike as far to the left as possible without trespassing on private property.

3. Stay along the roadside; do not go on lawns or around houses, barns, etc. Never take shortcuts across private property.

4. If it is necessary to cross highway M-37, cross together in a group; do not cross in the single file line.

5. Do not allow dogs or other animals to hike along with the group.

6. If it is necessary to use a telephone, only the adult should go to the house; the students should remain together in the driveway.

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Guidelines For Adult Supervisors On Drop-off Hikes

1. Organize the group after disembarking from the bus:

   A. Designate a student as the compass reader.

   B. Designate a student as the map reader.

   C. Designate the other students as "scouts" responsible for discovering clues.

2. Keep the group stationary: do not allow any "off-the-cuff" decisions to be made by members of the group.

3. Establish with the children a procedure for the first group decision:

   A. Have children recall the simulated experience during the orientation in which they located a point on the map using available clues. Apply that experience to the present situation.

   B. Have the compass reader tell the direction of the road.

   C. Have the scouts report all available clues they have discovered. (type of road, intersections, bodies of water, road signs etc.)

   D. Have the map reader (with help of some other students) determine if enough clues are available to locate their position on the map.

      1. If the group feels it has enough information to make a decision, allow the decision to be made; <u>insist that the decision be made by a majority of the group</u>.

      2. If the group feels it doesn't have enough information to locate itself at this point, then allow the children to make an arbitrary decision to begin hiking until they are able to find more information.

4. The succeeding group decisions should be accomplished in similar fashion. Insist that all decisions be made by a majority of the students.

5. Alert the students periodically of the necessity of checking their progress as new clues become available.

6. Remember you are responsible for seeing that the students follow the rules established for the hike.

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DROP OFF HIKE SUMMARY

1. How far did you walk? _____

2. How long did you walk? _____

3. What was your average speed? (Divide the number of hours you walked into the number of miles you walked.)

_____

4. What was your general direction from camp when you were dropped off?

_____

5. Name the roads you walked on: _____

_____

6. On the back of this paper, draw a map of the route you took (include the names of roads and types of roads and other symbols you learned).

7. List at least three (3) interesting things that you did, saw, smelled, touched or heard on this hike.

_____

_____

_____

_____

_____
(name)

ANIMAL TRACKING IN WINTER

A. ACTIVITY RATIONALE

Wild animals are still quite common in southern lower Michigan. With the exception of a few species of mammals such as the black bear, porcupine, and elk, most of the animals that inhabited the area when the first settlers arrived in the area can still be found. However, many animals are shy and try to avoid human activity. A large percentage of mammals are nocturnal and venture from their homes only at night. Thus, we are more likely to see signs of the presence of animals than the animals themselves. The most frequent signs of the presence of animals are their tracks which can be observed in dust, mud, or snow.

Tracking is an ancient science which has long been associated with the skill of hunting. Whereas man is no longer dependent upon hunting for his existence, the modern hunter recognizes that his ability to "read a story" in tracks contributes greatly to the success and enjoyment of hunting as a skill.

Man is basically curious about the other animals that inhabit our natural environment. Children develop an interest in the larger mammals at an early age and become curious about how they exist.

The animal tracking activity at the Outdoor School is designed to introduce children to animal tracking as a means of discovering and gathering evidence about the existence and habits of some of the common animals that inhabit this area.

B. RECOMMENDED GRADE LEVEL

This activity is an optional winter activity for fifth grade Battle Creek students.

This activity is applicable at either the fifth or sixth grade level for students from non-Battle Creek district schools.

C. BACKGROUND INFORMATION FOR TEACHERS

Animal tracking as a large group activity functions best in an area where children can spread out. In the course of the activity children may progress from one natural

area to another (for example: from a frozen marsh area, through an open field, to a hardwood forest.)

Tracks of the following animals have been commonly observed during winter in the Clear Lake area: opossum, skunk, fox, deer, cat, dog, mice, rat, raccoon, squirrels, rabbit, and various species of birds. Tracks of the beaver, chipmunk, woodchuck, and muskrat have been observed infrequently.

The outdoor school provides a phamplet entitled "Who Goes There" (see pages W-42-6) to aid in the identification of tracks in the field.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

The success of this activity is dependent upon a snow cover on the ground. It is generally best to pursue animal tracking shortly after a fresh snowfall, since a track in snow is different after a warm sun has shone on it - enlarging and distorting it.

Animal tracking is conducted throughout the winter season whenever suitable weather conditions prevail, and there is a layer of snow on the ground.

E. DESCRIPTION OF ACTIVITY

INDOOR ORIENTATION

1. Ask the class to tell you the names of animals they think are living in the Clear Lake area.

   Write the word animal in the top center of the chalkboard and make a list in a column of the names of the animals. (The list should include all the names mentioned above in section C.)

2. Write the word habitat in the top right section of the chalkboard.

   Have the students discuss the meaning of the word; list on the chalkboard all the various habitats that the students can describe.

3. Write the word food on the top left section of the chalkboard.

   Discuss with children the importance and availability of foods in winter. List on the chalkboard as many examples as possible of natural foods for animals in winter.

4. Write the word hibernator on the chalkboard and discuss its meaning with the students.

   Stress that some animals must hibernate because it is difficult for them to find food in winter.

   Have the students scan the list of animals and decide which ones they think are hibernators. The list should include chipmunk, woodchuck. Place an H in front of their names.

5. Point out that some animals are semi-hibernators because they remain in seclusion in their homes during the winter and seldom venture out because they have stored a supply of food in or near their home. Examples of such animals are the beaver and the muskrat. Place the letters S-H in front of their names.

6. Indicate to the students that the animals on the list that are not marked with an H or S-H are those whose tracks are most likely to be found in the snow.

7. Develop the concept that the tracks of animals are most likely to be found around their habitat or the area in which they search for food.

   Have the students determine the habitat(s) for each animal on the list; draw a line(s) on the chalkboard from the animal to the correct habitat(s).

   Also have the students determine which foods each animal is likely to be searching for; draw lines on the chalkboard from each animal to their foods.

   Indicate that understanding the feeding habits and habitats of animals can be helpful to the animal tracker.

8. Distribute a copy of "Who Goes There" to each student.

   Have students note how animal prints vary in shape and size.

Indicate the importance of measuring the length or width of tracks in the field before making a decision; point out that there is a scale in inches at the bottom of each page of the booklet.

Tell students that the phamplet can be used effectively in the field to identify the tracks.

9. Organize the class into teams of "hunters".

Suggest that upon entering the field each team should begin to "hunt" for tracks.

Indicate that when the first discovery is made, all teams should assemble together at that point and try to make an identification. After each identification the students should try to create a story based on any evidence available. The story might be centered around the following questions:

1. Did the tracks lead to or from the animals' habitat?
2. Was the animal running or walking?
3. Was the animal looking for food; if so, what?
4. How far did the animal travel?
5. Was the animal moving quickly or slowly?
6. Did anything unusual happen?

FIELD STUDY

1. Have the students choose the type of area in which they wish to "begin the hunt". For example: an open field.

Before the teams disperse the students should recall from the orientation which animals they predicted would be in the chosen area.

2. As soon as the first tracks are discovered, all teams should reassemble and try to "tell the story".

3. From this point on, the procedure to follow for field study should vary depending upom the success of the teams.

Whenever ready, the entire class should move to a new area, for example: the hardwood forest.

POST ACTIVITY DISCUSSION

1. Each team of "hunters" should report on the most exciting discoveries they made.

2. The total class should summarize the activity by responding to the following possible questions:

    a. How many kinds of animals were observed?

    b. The tracks of how many different animals were observed?

    c. Were some animal habitats observed?

    d. Was some evidence of animals feeding discovered?

WHO GOES THERE?

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SCHOOLS

Deer

overlapping

dew claws showing

Mouse

running (about natural size)

1½"

Dog

vary greatly in size

1 2 3 4 5 6 7 8

Fox

walk

lope

2"

RF RH LF LH

Raccoon

6"-20" or more

H F

3 3/4"

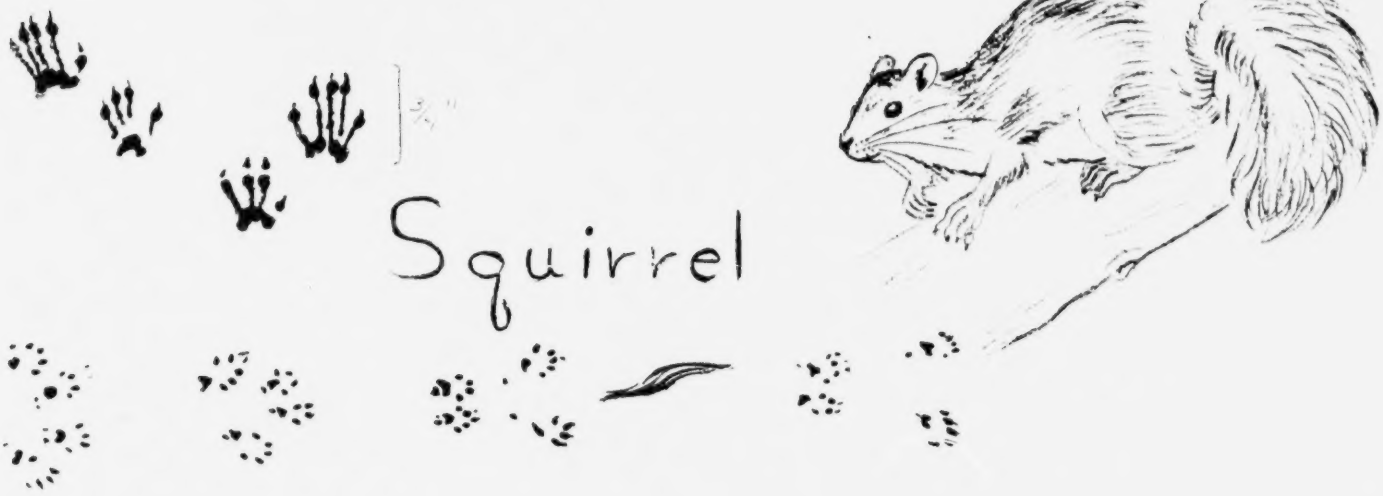
Opossum

7"

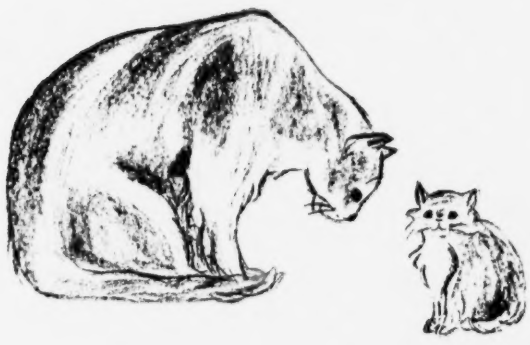
2"

1 2 3 4 5 6 7 8

W-44

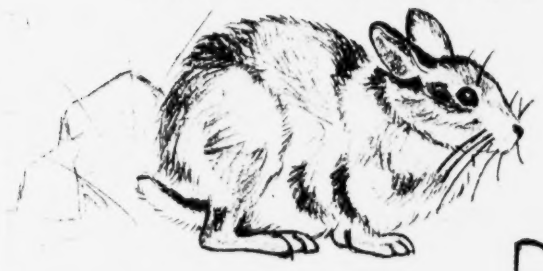


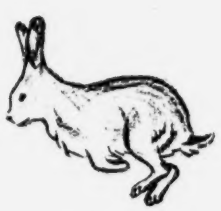
Squirrel



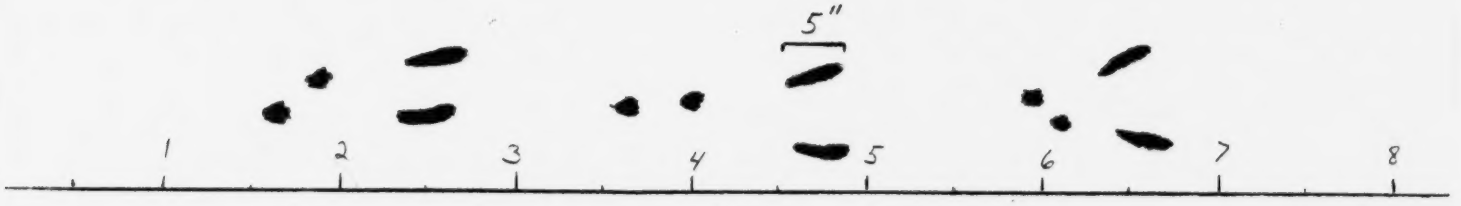
Cat

1" by 1" (both)

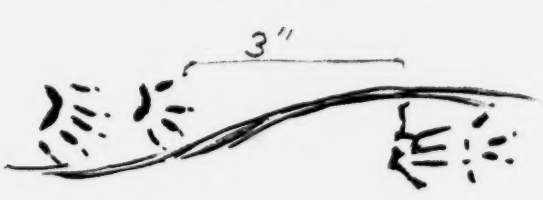




Rabbit

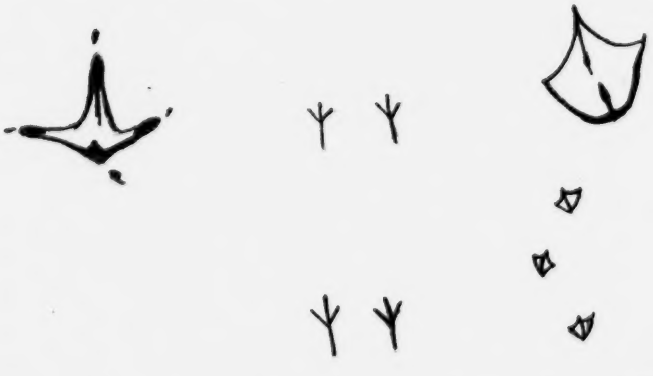


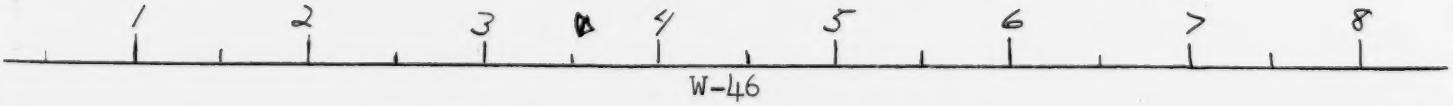
Skunk



Muskrat

A Story in Dust





WINTER LAKE EXPLORATION

A. ACTIVITY RATIONALE

Michigan, known as the Water Wonderland, is a state well known for its many lakes. Barry County is known to have more than 300 lakes, most of which are easily accessible to the residents of south central lower Michigan. Summer recreational opportunities lure thousands of persons to the lakes. However, when the cold winter climate freezes the surface of the lakes, these bodies of water are more accessible and conducive for exploration and discovery.

Children are generally fascinated when they are exposed to the frozen expanse of a lake in winter. The desire to venture out onto the ice is great, and one becomes curious about both the natural life in the lake and its physical aspects.

The winter lake exploration activity at the Outdoor School is designed to provide children with the opportunity to explore on the ice cover of Clear Lake and make discoveries that provide them with a knowledge of some of the natural life in the lake in winter and some of its physical aspects. Emphasis should be placed on encouraging children to develop their own methods of gathering data to answer questions.

B. RECOMMENDED GRADE LEVEL

This activity is an optional winter activity for fifth grade Battle Creek students.

This activity is applicable at either the fifth or sixth grade level for students from non-Battle Creek district schools.

C. BACKGROUND INFORMATION FOR TEACHERS

A solid ice cover usually forms on Clear Lake early in December. A minimum layer of four inches of ice is required before children are permitted to walk on the ice. In some years the ice is not safe to hold substantial weight until late in December. However, the ice is nearly one hundred per cent accessible during January and February.

Usually the ice layer continues to thicken gradually until late in February. The average ice thickness reaches about 12 inches. However, during winters when there has been considerable snowfall combined with periods of freezing and thawing, ice layers in excess of twenty inches have been measured.

Clear Lake is a rather shallow lake. The maximum center depth averages between ten and twelve feet, and there are very few known deep holes. The lake bottom is covered with heavy plant growth.

The following materials and equipment are available at the Outdoor School: pencils, paper, clipboards, string, rope, tarpaulins, blankets, rulers, water thermometers, ice spuds, ice scoops, and depth finders.

D. SEASONAL IMPLICATIONS FOR THIS ACTIVITY

This activity is dependent entirely upon the presence of adequate ice cover on the lake. Usually, once a safe ice cover is formed the lake can be used continuously for the remainder of the winter activity season.

It is best to plan this activity on calm winter days. Cold days when it is windy are impractical, since the wind adds greatly to the discomfort of children and hinders the success of the activity.

E. DESCRIPTION OF ACTIVITY

1. Distribute a copy of "What Do We Know About Clear Lake In Winter" to each student (see pages W-50 - W-51).

   Encourage the students to answer all of the questions even though they are probably guessing.

2. After the students are finished answering the questions, discuss each question briefly summarizing their various responses to some of the questions; be sure not to draw any conclusions at this point. Emphasize that the correct method to obtain an answer is to go into the field, make observations, and gather data.

3. Indicate to students that during the course of the winter lake activity they will be able to answer as many of the questions as they wish by going out on the lake and doing some investigation.

4. At this point the students should discuss and develop a plan for gathering information to answer each of the questions. Each plan should be formulated and agreed upon by the students. The outdoor school teacher should support each plan by indicating what materials and equipment can be provided by the Outdoor School.

5. The class should now be divided into activity groups for field exploration. Each activity group should decide which problems they intend to solve. The groups should be encouraged to work independently.

6. All needed equipment should be gathered together and accounted for before going out onto the lake.

7. One adult should be assigned to each activity group.

8. The Outdoor School teacher should assemble the entire class on the ice and review the ground rules for activity on the ice.

9. For the remainder of the activity each group should work independently with the outdoor school teacher coordinating all activity.

10. The outdoor activity should terminate early enough to allow for about 30 minutes of post-activity discussion.

11. During the post-activity discussion each activity group should report their findings.

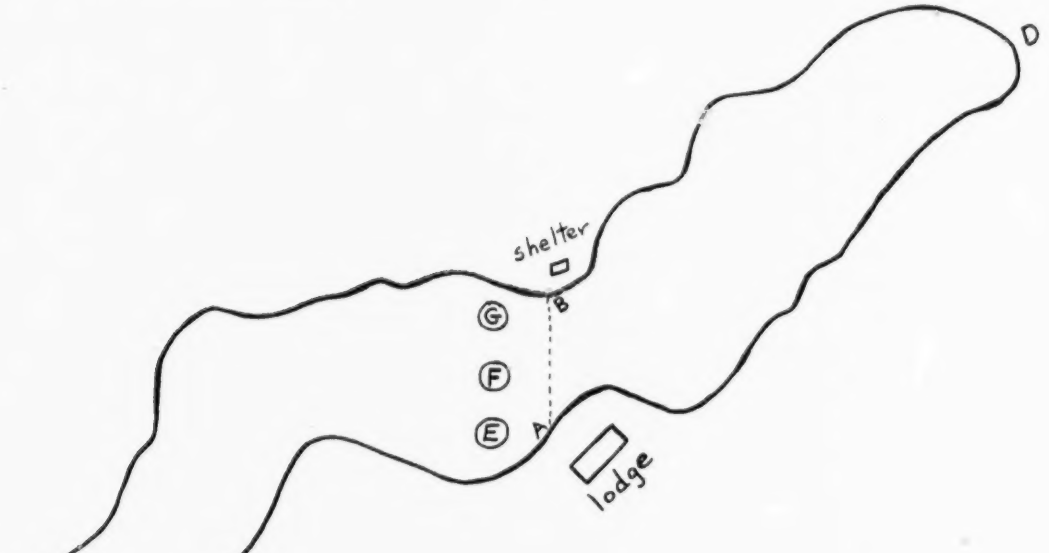
    The Outdoor School teacher should coordinate the results and guide the students in determining their response to each question.

12. The students should be encouraged to compare the results of the activity with the answers they predicted before the activity.

OUTDOOR EDUCATION CENTER
BATTLE CREEK PUBLIC SCHOOLS

WHAT DO WE KNOW ABOUT CLEAR LAKE IN WINTER

Following are some questions boys and girls have asked about Clear Lake in the winter. You probably will not answer all of the questions accurately. However you should guess or estimate an answer for each question. After you and your class have finished the winter lake exploration activity, you will have an opportunity to compare your answers with the findings of the entire class.



1. How thick do you think the ice is?

_____ inches

2. What do you think the temperature of the water is.....

_____ ° one foot below the ice?

_____ ° four feet below the ice?

_____ ° seven feet below the ice?

_____ ° at the bottom of the lake?

3. What do you think the depth of the water is.....

_____ feet at area E?

_____ feet at area F?

_____ feet at area G?

4. What do you think the width of the lake is between point A and point B?

_____ feet

5. What do you think the length of the lake is between point C and point D?

_____ miles

6. What do you think the bottom of the lake looks like?

7. In the space below draw what you think the bottom of the lake is shaped like between point A and point B.

A_____ice cover_____B

UNDERSTANDING OUR ENVIRONMENT-
EXPLORING IN THE CEDAR CREEK WATERSHED

A. ACTIVITY RATIONALE

Within the boundaries of the forested Cedar Creek drainage basin nearly all types of surface features, plant cover, and animal life typical of southern Michigan can be observed directly by students.

Ecological relationships important to the management and wise use of our forest lands and the animal communities they support can be developed in this kind of setting.

This activity is designed to afford children an opportunity to explore a landscape characteristic of much of the southern half of the lower peninsula of Michigan where early farming and logging methods ruined the hilly land for agricultural use. The land has since been planted in part as a tree farm whereas the remainder has been abandoned to a natural plant succession of mixed hardwood trees and shrubs.

B. RECOMMENDED GRADE LEVEL

This activity is recommended for inclusion in the fifth grade program for Battle Creek students.

This is also a recommended winter activity for non-Battle Creek district students.

C. BACKGROUND INFORMATION FOR TEACHERS

The portion of the Cedar Creek watershed students will explore is an area of glacial moraines and low lying wetlands covered with second growth stands of mixed hardwoods and planted conifers.

Cedar Creek forms the northwestern boundary of the area, lying in a sinuous, narrow, swampy, valley. Yellow poplar, river birch, and tamarack grow in the boggy bottomland in the creek valley.

Aspen, sumac, and black cherry, the first generation of abandoned field succession trees, are mixed in and around the planted stands of jack, red, and white pines.

The small lakes and ponds in the area support a variety of aquatic life including a sizeable muskrat colony and a normal complement of ducks and wading birds.

An abandoned home site on the east side of the area, recognizable from foundation ruins and floral escapes, provides evidence for related interpretation of the area.

A climax forest stand of beech trees, 70-80 years old, grows on the northwest side of a large, well defined, glacial deposit near the creek.

Along the sandy bluffs of the creek valley many springs bubble upward carrying ground water to the creek from the uplands to the east.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

The Cedar Creek watershed area is easily accessible throughout the winter season except during periods of very deep snow. On snowy or cold and windy days the area is still suitable for winter hiking and outdoor exploration, as the heavy timber growth combined with the hills and valley protects the winter hiker from the elements of the weather.

E. DESCRIPTION OF THE ACTIVITY

Indoor Orientation

1. The orientation should be brief. Using a county road map and/or a topographic map of the area, point out to the children the area in which they will be exploring and indicate its approximate distance from the camp by bus.

2. Distribute one copy of a map, Cedar Creek Watershed Exploration Area, (see page W-66) and a clipboard to each student.

   Indicate to the students that as they hike along the trail they will be stopping at most of the following interesting areas:

   SENTINAL OAK

   WHITE PINE STAND

   DEAD ELM AVENUE

   PINEY UPLANDS

   CEDAR CREEK BLUFF SPRINGS

HOGBACK RIDGE

BEECH HOLLOW

ABANDONED HOME SITE

3. Develop the following key questions and indicate that the answers will be discussed at the conclusion of the activity:

   a. What evidence can you find for the original use and misuse of the Cedar Creek area by the early settlers?
      1. topsoil is gone
      2. house site is abandoned
      3. nearly all second growth timber, even on steep hillsides
      4. fenced areas suggest cattle and cleared land

   b. Are the present owners managing the land in a wise and useful way?
      1. tree farming
      2. abundance of wildlife
      3. recreational use

   c. Can you find evidence that the area now supports a large wildlife community?
      1. adequate cover for mammals, birds, reptiles, and amphibians
      2. natural food supply
      3. evidence of animals-burrows, lodges, drillings, scats, tracks, gnawings, etc.

   d. If you could do anything you wished, what would you do to make the area more useful than it is now?

FIELD STUDY

After disembarking from the bus, help the children orient themselves on their maps and begin hiking to Sentinel Oak. Following is a description of each of the learning resource areas the children will be

visiting along the trail and a listing of suggested questions to explore with the students.

1. Sentinal Oak

A very large white oak growing just beyound the saw mill on the north side of the lane. White oaks grow very slowly. This tree is probably over 100 years old.

White oak was a favorite wood of the Michigan pioneers because it was very strong and resisted decay. The decay resistant qualities made the wood useful for shingles and fence posts.

Questions To Explore

A. HOW BIG IS A BIG TREE?

Have children grasp hands and measure the tree with a living rope. How many "people units" are in the circumference. Compare the oak's circumference with other trees students will see throughout the area.

B. WHAT EVIDENCE DOES THE TREE OFFER FOR TELLING THE "USE HISTORY" SINCE THE CIVIL WAR OF THE IMMEDIATELY SURROUNDING LAND?

Look at the general shape of the tree. Are branches concentrated near the top or are they spread all over the trunk?

C. DO WHITE OAK TREES GROW NATURALLY IN THIS AREA; IS THERE ANY EVIDENCE THE WHITE OAK IS REPRODUCING?

Have students look for "oak seeds" (acorns) or seedling oaks growing under the tree or nearby.

D. WHY HAS THIS VALUABLE WHITE OAK ESCAPED THE SAWMILL FOR THE LAST 25 YEARS?

Compare the logs in the sawmill yard with the white oak trunk. Look for differences that might make the tree undesirable for lumber.

2. White Pine Stand

This is a thirty acre stand of planted eastern white pine trees. The white pine is the "state tree" of Michigan. Between 1840 and 1880 the white pine logging industry of Michigan supplied lumber for over 80% of the homes built in the upper midwest.

Relatively few virgin or original white pines now exist in the state, even though much of Michigan was once covered with dense stands of this magnificent coniferous tree.

The white pine is so-named because of its smooth, easily worked, white wood. The tree is readily recognized by its long, silky needles, arranged in clusters of five, and the smooth, dark gray bark on the upper trunk.

Questions To Explore:

A. IS THE WHITE PINE STAND A NATURAL FOREST, OR HAS IT BEEN PLANTED?

Have students observe tree spacings and locations. Compare with the coniferous growth just to the east of the grove.

B. HOW OLD IS THE PINE GROVE?

Have students compare tree height and trunk diameters with the Sentinel Oak (100 years old.) On the basis of their comparison students should make an educated guess.

Show students how to "age a pine tree" by counting the number of whorls of branches between the ground and the top of the tree. A young white pine by the dead elms is useful for this activity.

C. HOW MANY YEARS WILL PROBABLY NEED TO PASS BEFORE THE WHITE PINES WOULD BE USEFUL FOR LUMBER?

Compare the standing white pine log size with those logs lying in the sawmill yard. Based on the current age of the white pines, the current trunk size, and the saw log trunk diameters, extrapolate the approximate age of the white pines when they would be good marketable timber.

Relate this number to the age of the students when the trees will be mature. Emphasize the time period required to renew forest resources.

D. WHAT IS UNUSUAL ABOUT THE FOREST UNDERSTORY IN THE PINE STAND AS COMPARED TO A DECIDUOUS FOREST?

Compare the distance students can see across the pine stand to the same distance students can see in nearby deciduous forests.

What makes the difference?

Look at the forest floor cover. How is this material related to a "clean understory"?

Tell students they will explore a coniferous forest floor in more detail in another part of the area, to answer the question.

E. IS THERE ANY EVIDENCE THAT MAN HAS BEEN "FARMING THIS FOREST"?

Have students look at lower tree trunks; should tree limbs be growing there? Did they fall off? Were they cut off? Is there evidence on the ground?

If the tree limbs have been deliberately removed, why would someone go to that much trouble; recall the Sentinel Oak.

F. THE WHITE PINE STAND IS POSTED "NO TRESPASSING". WHY MIGHT THE OWNER BE CONCERNED ABOUT PEOPLE IN THE FOREST?

Show students the combustibility of a handful of pine needles.

3. Dead Elm Avenue

Along the lane beside the pine grove are a number of American Elms, 20-40 years old, that have succumbed to the Dutch Elm Disease that has been sweeping the country during the last two decades.

The elm disease agent is a fungus that grows in the outer sapwood of the tree disturbing the vital flow of water and nutrients between the leaves and roots.

The fungus is carried by a small beetle that lays its eggs under the bark. These eggs are contaminated and hatch into burrowing larvae which also carry the fungus. Eventually these larvae change into adult beetles which fly to other trees, thus spreading the disease.

It is almost impossible to stop the beetle from infecting trees. Therefore, research efforts are underway to create a population of disease resistant trees.

Questions To Explore:

A. WHAT EVIDENCE CAN YOU FIND FOR THE CAUSE OF DEATH OF THE ELM?

Have students examine the undersides of slabs of elm bark that have fallen to the ground. Interpret the patterns found on most of the bark slabs.

B. DOES THE AGE OF AN ELM TREE SEEM TO MAKE ANY DIFFERENCE IN TERMS OF ITS GETTING THE DISEASE?

Have students compare the ages of the dead trees based on their relative heights and circumferences.

Examine the grove of young elm trees to the south of the lane; are they dead? Suggest an explanation for what you find.

C. DOES THE DISEASE KILL OTHER KINDS OF NEARBY TREES?

Have students look at other nearby tree types to determine if they are living or dead. (When leaves are not on trees, skin back a piece of bark on a twig. If the inside is green, the tree is living; if the inside is brown, the tree is probably dead.)

Relate tree diseases to animal diseases. (Monkeys and people are both primates, but they do not necessarily get the same diseases.)

4. Piney Uplands

A mixed stand of planted red and jack pines cover a hillside west of the north marsh. The trees were machine planted as evidenced by furrows still visible on the forest floor.

Red pines are easily recognized by their long stiff needles arranged in bunches of two and the rough, scaly-looking, brown bark on the trunk. Jack pines have short needles that spiral or twist as they grow out from the stem. Their cones are small and spherical when opened. The jack pine tree generally presents an unkempt, knobby appearance.

Red pine is a native Michigan tree although it is not common. Jack pines are associated with forest fires and burned over forest land. The center section of the lower peninsula of Michigan is famous for its jack pine forests.

Questions To Explore:

A. WHAT EVIDENCE IS AVAILABLE TO SHOW THAT THE PINEY UPLANDS IS A PLANTED FOREST?

Have students compare what they see in this pine stand to what they saw in the white pine stand.

Look for the remains of furrows along the tree row.

B. LARGE, BUSHY, BLACK CHERRY TREES ARE FOUND GROWING IN DIFFERENT PARTS OF THE PINE STAND. WERE THEY PLANTED?

Have students age the surrounding conifers; tell them the cherry trees are about five years older.

Relate the "bushiness" of cherry trees to the "bushiness" of surrounding pines.

C. WHY ARE SO MANY OF THE RED PINES BROKEN OVER?

Have students note the direction of the fall, the characteristics of the break, the height of the break above the ground, and the thickness of the broken trunk. Are there any patterns that can be related to wind direction, snow load, or disease.

D. WHAT ARE SOME CHARACTERISTICS OF THE PINE FOREST FLOOR?

Have students measure with their forefinger the depth of the pine needle cover down to the soil surface.

Carefully remove the needles, layer at a time, from a small undisturbed portion of the forest floor. Try to see how many distinctive layers there are in terms of needle deterioration.

Can the needle layers be correlated with seasonal droppings?

Test the forest floor layer at the interface of the pine needles and the soil for PH. Relate the findings to the plant cover in the forest understory.

E. AN UNUSUAL PLANT TYPE IS COMMONLY FOUND ON PINE FOREST FLOORS IN MICHIGAN. CAN YOU FIND IT?

Have students look for small greenish white plants that are usually less than one inch in height growing in small openings in the pine needles. Some will be shaped like tiny cups and others like upright rods capped with red rounded tops.

These plants are members of a group called lichens. Lichens are really two kinds of plants, a fungus and an alga living together in a mutually beneficial relationship. Lichens are often found growing where nothing else can.

Relate the lichen's unusual life style to the relatively alien conditions that exist on the piney uplands floor.

F. WHY IS A SINGLE LARGE RED PINE TREE DEAD EVEN THOUGH IT IS COMPLETELY SURROUNDED BY OTHER HEALTHY RED PINES?

Have students speculate on factors causing the tree's death. Look for evidence on the trunk and on the ground nearby.

5. Cedar Creek Bluff Springs

The bluffs along the marsh in the Cedar Creek valley were in part created by the creek as it eroded away the land in its meandering contacts with the valley boundaries.

The sandy valley walls give away at their base to the boggy bottomland composed of plant debris similar to that found in a marsh. Also at the base of the bluff are numerous springs that break out at the water-table represented by the top of the valley floor and flow sluggishly towards the creek.

Questions To Explore:

A. HOW DEEP IS THE BOGGY MATERIAL IN THE VALLEY?

At the springs have students push a long straight stick down as far as it will go. Relate these findings to the story of the valley.

B. WHAT UNUSUAL CONIFEROUS TREE GROWS IN THE BOGGY BOTTOM LAND? A DECIDUOUS EVERGREEN?

Show students a tree with no needles (and no leaves either in winter); look for dropped needles and check tree twigs to show tree is alive, not dead.

6. Hogback Ridge

This is a high humpbacked ridge, over one hundred feet high, with steeply sloped sides. The ridge extends northeast-southwest and lies parallel to Cedar Creek.

The ridge is a relic of the last ice age and represents a glacial deposit that has been steepened on two sides by streams cutting away at its base in times past. It is covered with a mixture of hardwoods including maple, beech, tulip, locust, and aspen.

"Broomstage Lookout" lies just southwest of the highest point on the ridge and is named after the tall brown broomsedge grass growing on the open area.

Questions To Explore:

A. HOW HIGH IS THE RIDGE?

Have students take measurements from "stump point" down into the wooded swamp on the southeast side of the ridge.

B. HOW WAS THE RIDGE FORMED?

Move students to a spot where they can pick up a handful of subsoil; interpret what they see and relate to the gravel pit and story of glaciers.

C. "BROOMSTAGE LOOKOUT" - WHY IS THIS AREA OF BARRY COUNTY SO HILLY?

Have students look southeast across the landscape from "Broomstage Lookout". The hilly topography is the result of the last ice age. This general area of Barry County is the location of a large terminal moraine system that cuts across a portion of southwestern lower Michigan and northern Indiana.

D. IS THIS SECTION OF THE COUNTY GOOD FOR AGRICULTURE?

Have students speculate on local land use, what it has been and what it is now. Students should make decisions on the basis of what they can see from the lookout.

Walk over to the large sugar maple just below the lookout. Tell students this maple is a testamonial to the misuse of the land on Hogback Ridge; have them interpret. Remember the Sentinel Oak.

7. Beech Hollow

This is a large stand of American Beech trees on the Cedar Creek side of Hogback Ridge. Beech prefers rich bottomland or upland soils. It tolerates shade and gradually dominates the forest growth. Its distinctive smooth gray bark, long pointed buds, and strongly veined leaves are characteristic. The fruit, a triangular nut, is eaten by mammals and birds. The wood is reddish, close-grained, and hard; it is used for furniture, wooden ware, barrel making, and veneer.

Many of these trees are 50-70 years old. An unusual flowering plant can be found growing under some of the beech trees. This plant, known as "beech drops", is a non-chlorophyll producing plant that lives on the roots of the beech trees.

The entire plant is white and grows in small clumps about one foot high.

When beech trees reach the age of many of the trees in the stand, they are usually not cut for lumber; the older beech trees characteristically form hollows in the centers of their trunks.

Questions To Explore:

A. THE FOREST FLOOR HAS AN UNUSUAL NUMBER OF HUMP-HOLE FORMATIONS; WHO MADE THEM?

Show students several examples; emphasize the fact that the hump is always beside the hole.

Have students suggest tentative explanations.

Show students a fresh windfall with dirt still around the roots. Relate this to other hump-hole formations.

Age one of the formations with the evidence available.

B. WILL THE PRESENT BEECH FOREST DISAPPEAR OR DOES IT REPRESENT A CLIMAX CONDITION?

Have students look for evidence of tree reproduction in the "hollow". What kinds of young trees are growing in the under-story?

The christmas ferns are found in abundance in the beech grove. Relate their presence to climatic conditions suitable for a beech climax condition.

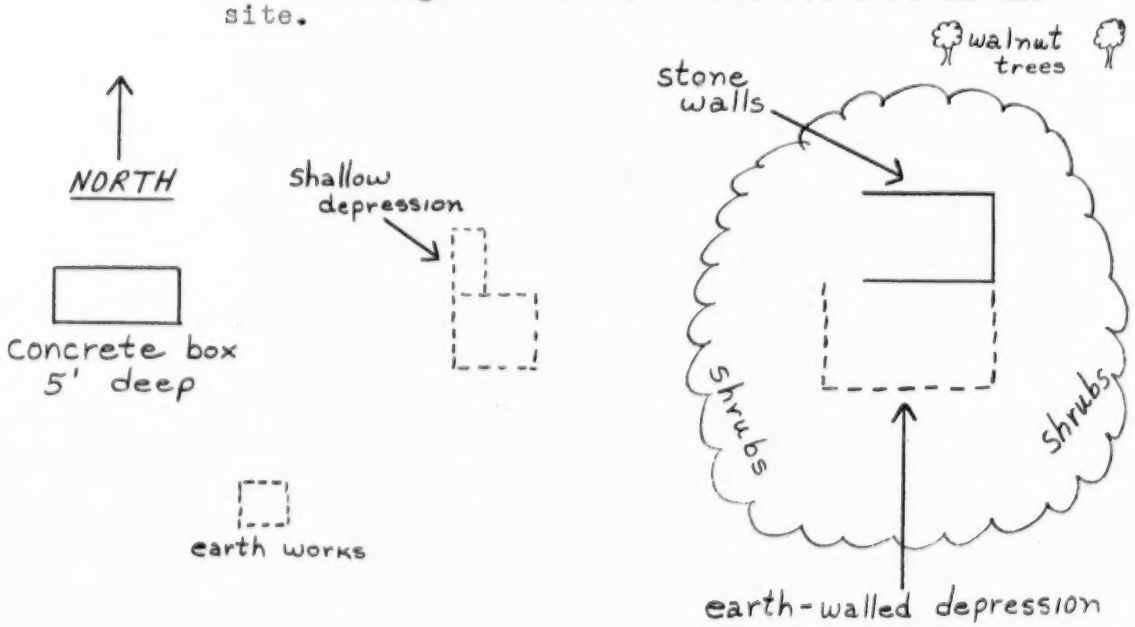
C. WHAT USE HAS MAN RECENTLY MADE OF THE BEECH GROVE?

Have students look for evidence; note any signs of lumbering and new fencing.

8. Abandoned Home Site

Just west of the white pine grove along the north side of the lane are the remains of an old home site. The "ruins" cover an area about 200' long and 100' wide. There are numerous holes and foundation lines. Some concrete and stonework can be seen.

On the east end of the site a large floral escape of lilac shrubs are visible. Several walnut trees and one large eastern red cedar are also on the site.



LANE

Questions To Explore:

A. WHAT EVIDENCE IS AVAILABLE TO SUPPORT THE IDEA OF AN ABANDONED HOME SITE?

Have the students search the area for unnatural situations or conditions.

Emphasis should be placed on trees, shrubs, and ground modifications.

Collect as much evidence as possible.

B. APPROXIMATELY HOW LONG AGO WAS THE SITE ABANDONED?

Look for aging clues such as trees growing on foundations, etc.

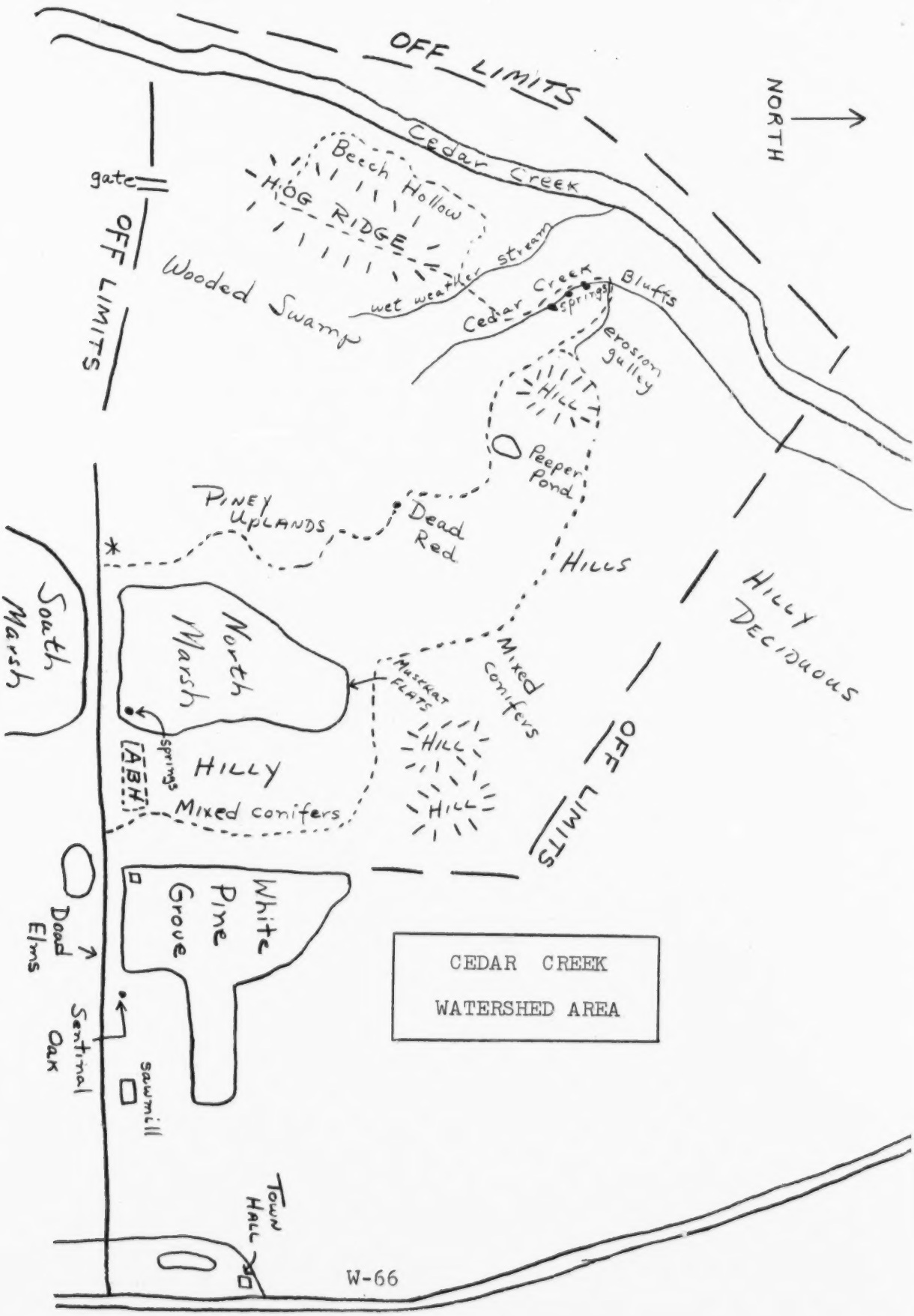
C. WHY WAS THE SITE ABANDONED?

Have the students speculate on various possibilities such as fire, farming, bad land, bad location, disease, etc.

D. WAS THE SITE REALLY A HOME SITE, OR WAS IT SOME OTHER KIND OF SITE?

Have students measure the largest foundation; is it large enough for a house?

What do all the other squares on the ground represent? Are any large enough for a barn? What could the concrete box have been used for?


OFF LIMITS
NORTH
Cedar Creek
gate
OFF LIMITS
Beech Hollow
HOG RIDGE
Wooded Swamp
wet weather stream
Cedar Creek
springs
Bluffs
erosion gulley
HILL
Peeper Pond
PINEY UPLANDS
Dead Red
HILLS
HILLY DECIDUOUS
South Marsh
North Marsh
MUSKRAT FLATS
Mixed conifers
OFF LIMITS
springs
CABIN
HILLY
Mixed conifers
HILL
HILL
Dead Elms
White Pine Grove
CEDAR CREEK
WATERSHED AREA
Sentinal Oak
sawmill
TOWN HALL

WINTER POND LIFE -
"PROBING FOR PLANKTON"

A. ACTIVITY RATIONALE

Wetlands cover a substantial portion of the state of Michigan and are valuable as waterfowl breeding areas and natural water storage areas. In addition swampy areas provide cover and food for many larger animals including the white-tailed deer. The smaller life forms in marshy and swampy areas are an important part of the food chain that supports animal populations outside the immediate environs of the swamp.

It is important in this age of massive and extreme landfill and drainage projects for children to become aware of the usefulness of these important resources in maintaining desirable balances in the natural community.

Examination of a pond in the winter will focus on the zooplankton, copepods, water fleas, algae, midge larvae, worms, and other invertebrates that form the base of the food pyramid. In addition to gaining some insights into the food pyramid base, children will have an opportunity to see evidence for the continuity of life throughout the winter months in an aquatic environment.

B. RECOMMENDED GRADE LEVEL

This activity is designed to be the first of two exploratory activities centering around the pond for Battle Creek students and is recommended for inclusion in the fifth grade program.

This activity is applicable at either the fifth or sixth grade level for students from non-Battle Creek district schools and is recommended for inclusion in the winter program.

C. BACKGROUND INFORMATION FOR TEACHERS

Mystery Pond is a quiet body of water so shallow that rooted plants grow entirely across it. The water temperature is fairly uniform from top to bottom and tends to change with the air temperature. There is little wave action, and the bottom is covered with a muck-silt

mixture about two feet deep. The muck is underlain by very hard clay that serves as a barrier to water loss into the sand below.

The swamp basin was originally created by landforms resulting from the Wisconsin Glacial Age which terminated in this area about 13,000 years ago. The number and kinds of plants and animals that make up the swamp community is continuously changing. This swamp started as a sandy-bottomed pond. Seeds of emergent aquatic plants along with zooplankton and phytoplankton spores were carried by the wind, water, or pond visiting animals to begin the plant life in the pond. These plant pioneers established the conditions necessary for small fishes, snails, mussels, caddisflies, mayflies, dragonflies, turtles, frogs, and other small invertebrate forms to make a living.

As the pond weeds became increasingly abundant, they contributed enough decaying matter on the pond bottom each year to begin building up the bottom. In addition many emergent plants began to grow outward from the shore as the water becomes shallower, contributing to the buildup of bottom debris.

Today emergent vegetation including cattails, buttonbush, and cowlilies cover the pond surface. In several spots red maple trees have established themselves in areas where the pond bottom is at the surface. Salamanders, frogs, and turtles are the dominant large invertebrates. Many aquatic insects, worms, crustaceans, and microscopic life forms live in the shallow weedy areas and on or in the muck bottom.

D. SEASONAL IMPLICATIONS FOR THIS ACTIVITY

Weather is an influencing factor. The field study is most successful when there is sufficient ice on which to walk on the pond. Normally the first ice cover appears on the pond late in November. Depending upon weather conditions, the pond is usually safe (an ice thickness of at least four inches) to walk on by mid-December.

Due to the openness of the pond area, outdoor exploration is not advised on cold, windy days in winter.

E. DESCRIPTION OF ACTIVITY

INDOOR ORIENTATION

1. What Is A Pond

   a. Have children suggest some things that they feel might be part of a pond. List their ideas on the board.

   b. Show pictures that will illustrate the major features of a meadow pond. Compare the features in the picture with the ideas listed previously by the students.

   c. Major pond features shown should include a pond cross section, submergent and emergent plants, small and large invertebrates, mammals, birds, fish, reptiles, and amphibians.

2. Ponds In The Winter

   a. List the following animals on the board (or on overhead transparency):

clams	crayfish	frogs
fish	worms	turtles
ducks	insects	salamanders
snakes	plankton	muskrats

   Tell students only the most important animals on this list can easily be found in the pond in winter.

   b. Discover by the process of elimination through discussion of such factors as water temperature, food requirements, dissolved oxygen, etc. that the only group of animals that can be most easily collected in the pond in the winter is plankton.

   c. Let's go on a "plankton hunt." Where do we look---surface (ice), open water (under the ice), or on the bottom (muck)?

   What do plankton look like? Show students some pictures of types commonly found in the pond.

   d. Plankton are very small, and one will require a microscope to see them.

IN THE FIELD

1. Organize students by teams to collect plankton from the bottom, open water, and surface layer (ice).

   Samples should be returned to the lab for observation.

2. When the ice is safe, other characteristics of the pond can be briefly explored. These might include muskrat lodges, animal tracks, ice thickness, water temperature, and water and muck depths in the pond.

IN THE POND LAB

1. Have children make some predictions about the plankton concentrations in each of their samples. Have children suggest some reasons for their predictions.

2. Pictures on pp. 32-37, 78-81, and 86-91, Pond Life by Golden Press, show some common plankton found in the pond.

3. Explain microscope techniques to students and have them examine their samples.

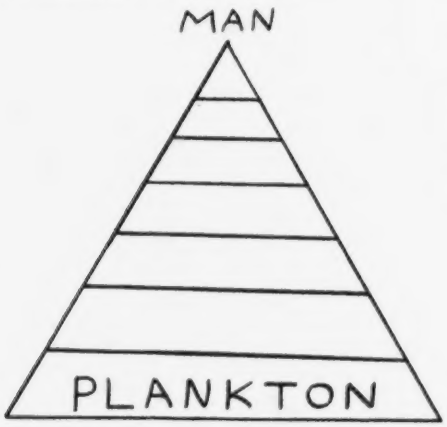
   Encourage children to look in their books to identify the living plankton they find.

4. At the end of the lab session, ask students why they think the plankton they have been observing are the most important living things in the pond.

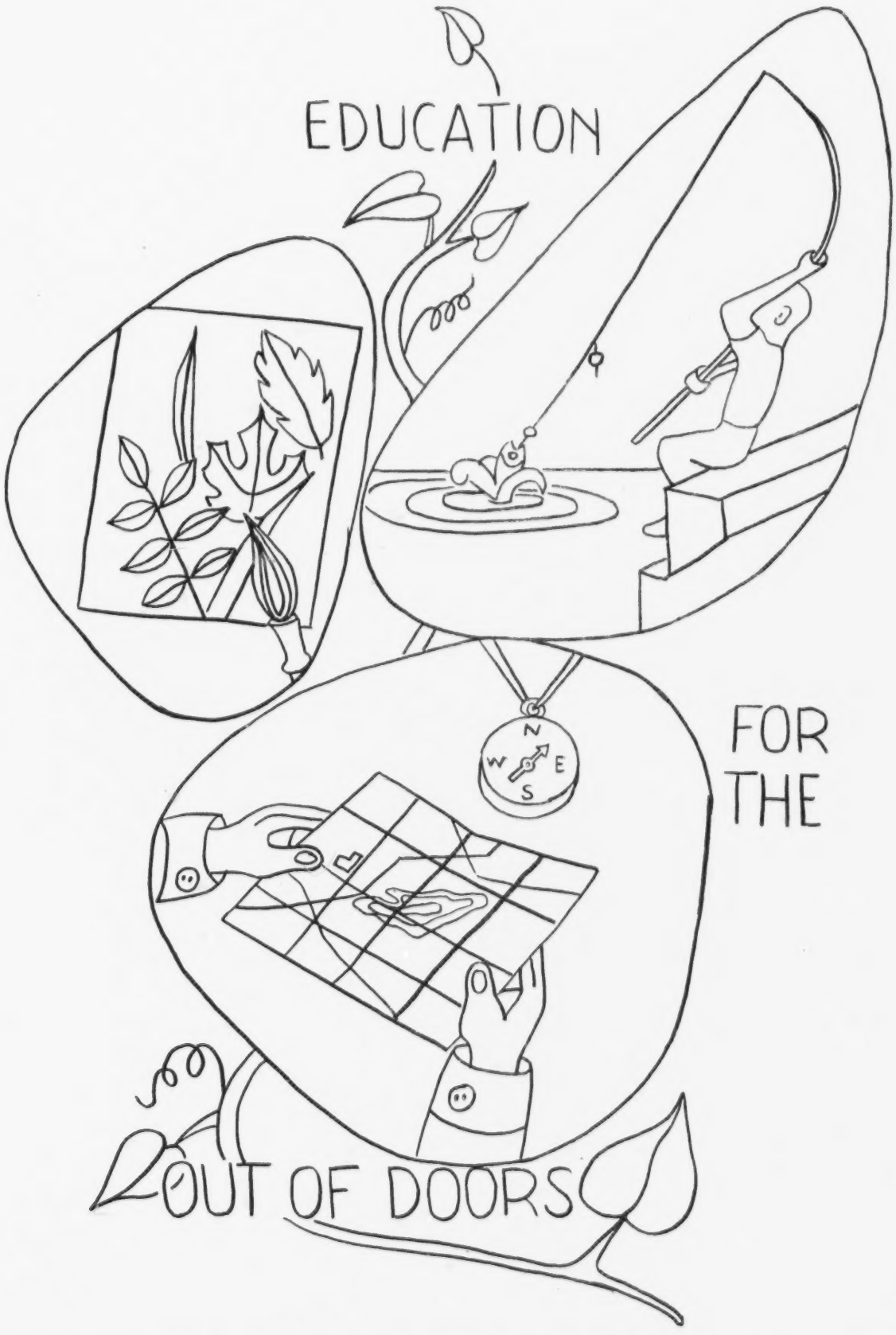
   Draw a picture:

Tell students this is a clue.

Draw another picture:



Tell students they are looking at a food pyramid. Some parts are missing, but the two most important parts of the drawing are there, MAN and PLANKTON. Next fall you will find the missing parts and learn why plankton are among the most important plants and animals in the pond.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ARCHERY

A. ACTIVITY RATIONALE

Archery is becoming more popular as an interesting field sport for children, and it also is becoming popular as family and adult recreation. As with other skill sports, archery appeals to girls as well as boys. The teaching of archery skills can begin with children in the upper elementary grades and should progress and continue into secondary schools and colleges.

There has been a steady growth of bow and arrow hunting in Michigan in recent years, and archery equipment will more frequently be falling into the hands of young people. As the sport grows in popularity, safety is becoming an important phase of instruction.

The archery experience at the Outdoor School is designed to introduce archery to children as a skill sport which can have continued carry-over value in later years of their lives. Emphasis will also be placed on identification and proper use of equipment, practice in skill proficiency, and safety practices.

B. RECOMMENDED GRADE LEVEL

This activity is applicable at either the fifth or sixth grade level.

C. BACKGROUND INFORMATION FOR TEACHERS

The Outdoor School maintains an adequate outdoor range with ample equipment to permit participation by an entire class. In order to meet recommended standards for children of elementary age the shooting equipment employed is lighter weight.

The Outdoor School maintains the following equipment for instructional use: targets, target faces, bows, arrows, quivers, arm guards, and finger tabs.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Weather is a key factor. Archery begins in the spring season as soon as days become warm or comfortable enough to permit activity on the outdoor range.

E. DESCRIPTION OF ACTIVITY

The following outline for the activity is suggested:

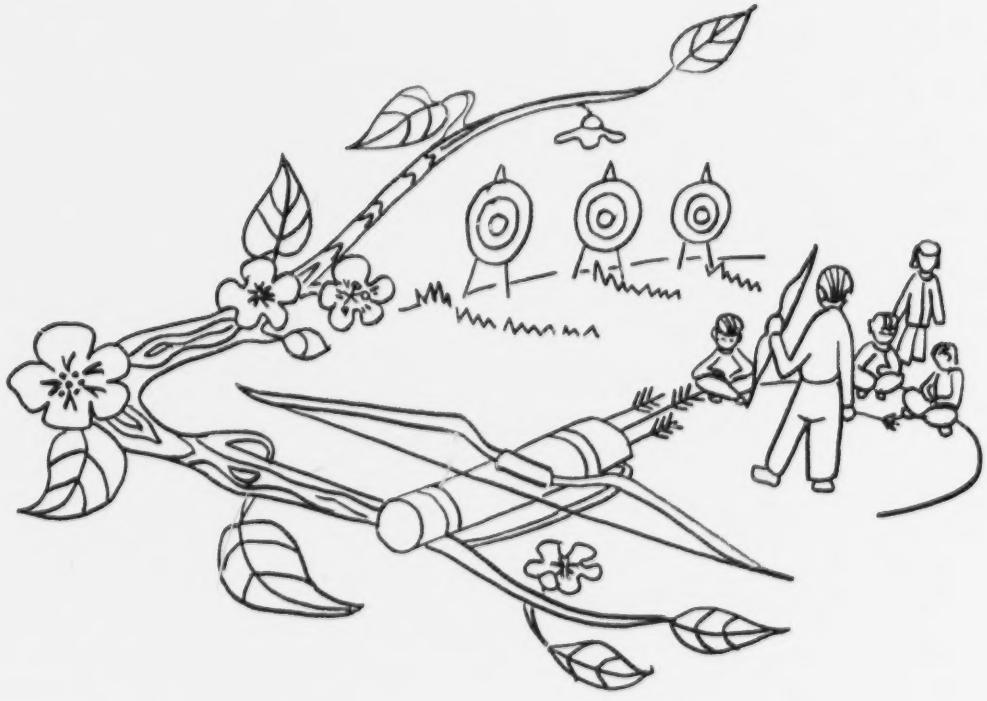
1. Introduction to Archery

    a. Brief history
    b. Value of sport

2. Equipment and facilities

    a. Bow selection
    b. Arrow selection
    c. Arm guards--necessity in wearing them
    d. Quiver
    e. Target

3. Care of equipment
4. Stringing and unstringing the bow
5. Stressing of safety
6. Arrow parts
7. Nocking
8. Stance
9. Draw
10. Aim
11. Release



GUN SAFETY AND INTRODUCTORY MARKSMANSHIP

A. ACTIVITY RATIONALE

Children's attention is drawn to guns at an early age. At the upper elementary age the desire to play with harmless toy guns fades, and the desire to have the experience and thrill of using and handling real guns becomes evident. It is at this age that many children become the owner or user of a simple but real gun, the air rifle. The first instruction in the care and use of guns is recommended during elementary school age, and a good place to start is with the air rifle.

There are two major areas relative to the use of guns: shooting for developing a skill, i.e. marksmanship, and shooting in the field as a skill sport in pursuit of wildlife, i.e. hunting. Both of these areas demand knowledge of the proper use and handling of guns to ensure the safety of all individuals. Hunting safety is a topic of concern in many states every fall. Recognizing the need for knowledge of gun safety the Michigan legislature has passed legislation requiring minors to pass a gun safety course before they are issued hunting licenses in Michigan. The purpose of the legislation is to prevent accidents by young hunters.

The gun safety and marksmanship experience at the Outdoor School is designed to educate boys and girls in the proper use and handling of spring-type air rifles. It is also designed to introduce marksmanship as a skill sport which can be developed and pursued over a lifetime. In addition emphasis will be placed on introducing elementary techniques of gun handling while moving about in the field. This instructional program should provide, specifically, a good introductory background for those boys and girls who will maintain an interest in hunting during their teenage years and will be applying for hunting licenses.

B. RECOMMENDED GRADE LEVEL

Recognizing that the child's interest in guns intensifies as he grows older, this experience is recommended for sixth grade students.

C. BACKGROUND INFORMATION FOR TEACHERS

The outdoor school maintains an adequate outdoor range with ample equipment to permit participation by an entire class. Lightweight spring-type air rifles are employed. Official National Rifle Association targets and certificates are used for marksmanship instruction. Children who demonstrate marksmanship ability are presented appropriate award certificates as a reminder of their success.

Two main areas are used for instruction. Introduction to the guns and dry firing are taught inside the camp lodge. Live firing is taught on the outdoor range. All instructional techniques employed by the Outdoor School teaching staff are N.R.A. approved.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Weather is not a critical factor. Outdoor instruction can be conducted throughout the spring except on cold, rainy days. Whenever necessary, an indoor range for live firing can be set up and utilized.

E. DESCRIPTIVE OUTLINE OF THE ACTIVITY

1. Introduction

    a. General discussion of guns

        1. Parts
        2. How they work

    b. Demonstration of various kinds of guns

        1. Shotgun
        2. Rifle
        3. Hand gun
        4. Air rifle

2. Dry Firing Instruction

    a. Correct prone position and holding the gun
    b. Sight picture
    c. Trigger squeeze
    d. Firing line safety rules

3. Range Procedure Instruction

   a. Always point muzzle down range or angled up away from anyone else.
   b. Three students work together: firing position, cocking position, and shot caller.
   c. Commands

      1. Assume position (by range coach)
      2. Cock the guns
      3. Ready on the firing line
         Ready on the right
         Ready on the left

      4. Take aim
      5. Fire one round (three-five rounds)

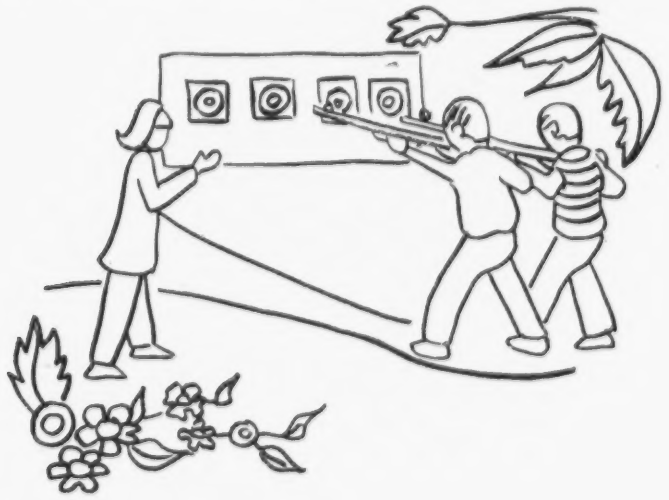
4. Range Firing

   a. Loading and unloading BBs
   b. Firing to command
   c. Replace targets for next person (on command only)

5. Shooting For Marksmanship

6. Safety Techniques In The Field

   a. Walking with an unloaded gun
   b. Walking with a loaded gun
   c. Crossing over a fence or stile with a gun
   d. Crossing through a fence with a loaded gun



FISHING IN CLEAR LAKE

A. ACTIVITY RATIONALE

Fishing is man's oldest form of outdoor recreation and it is claimed to be the most popular field sport in the world. Whereas our ancestors depended upon fishing largely as a source of food, man enjoys fishing today as a sporting activity. It is estimated that over thirty million persons become involved in fishing each year. In Michigan, where lakes and streams are abundant, fishing is a very popular outdoor activity pursued by both children and adults. Many carry-over activities such as target casting, fly tying, and constructing equipment can be developed which stem from one's interest in fishing; these activities are known to have life-long values.

Children become interested in fishing at an early age. In the past when most children lived in a more rural environment, they were exposed to fishing as a part of growing-up, and the opportunity to acquire needed skills from parents or relatives was greater. However, in today's highly urban environment the opportunity for children to learn the skills in the home is greatly removed, and it becomes necessary for educational programs to provide children with a background of outdoor skills.

The fishing activity at the Outdoor School is designed to introduce fishing to children as a skill sport and activity which can have lasting carry-over value throughout their lives. The activity is also designed to provide children with a knowledge of all aspects of fishing and acquaint them with the various types of fish present in a typical small lake in southern Michigan.

B. RECOMMENDED GRADE LEVEL

This activity is applicable at either the fifth or sixth grade level.

C. BACKGROUND INFORMATION FOR TEACHERS

A live display of the six kinds of fish most likely to be caught in Clear Lake are on exhibit in the Fish Room in the camp lodge. Children view the live fish before beginning outdoor activity.

There is ample lake shoreline for fishing. Children are also permitted to fish from the docks in the swimming area. Fishing is not permitted from boats.

Children may use their own equipment if they wish. However, the outdoor school provides ample equipment to permit participation by an entire class. Cane poles complete with hook, line, bobber, and sinker are available for use. A worm bed is available for securing bait, or other types of bait such as grubs, insects, or larvae can be gathered in the field. Cans for storing bait are also provided.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Spring is the best season for fishing in Clear Lake. As the lake water warms, the fish tend to move in closer to the shore where spawning beds are established. This provides ideal conditions for catching fish. However, weather conditions can influence the success of the activity; windy and cold days are not favorable, particularly early in the season.

E. DESCRIPTIVE OUTLINE OF THE ACTIVITY

1. Indoor Orientation

   a. Discussion of Clear Lake

      1. Depth
      2. Temperature
      3. Plant growth

   b. Discussion of fish in Clear Lake

      1. Types

         Bluegill
         Sunfish
         Large mouthed bass
         Bullhead
         Perch
         Pickerel

      2. Abundance

   c. Discussion of the parts of the fish and their function.
   d. Discussion of hooks and lures
   e. Discussion of live baits

2. Bait Digging

3. Outdoor Demonstration

   a. Preparing a cane pole

      1. Placing the line on the pole
      2. Attaching the hook to the line
      3. Attaching the sinker to the line
      4. Attaching the bobber to the line
      5. Placing the bait on the hook

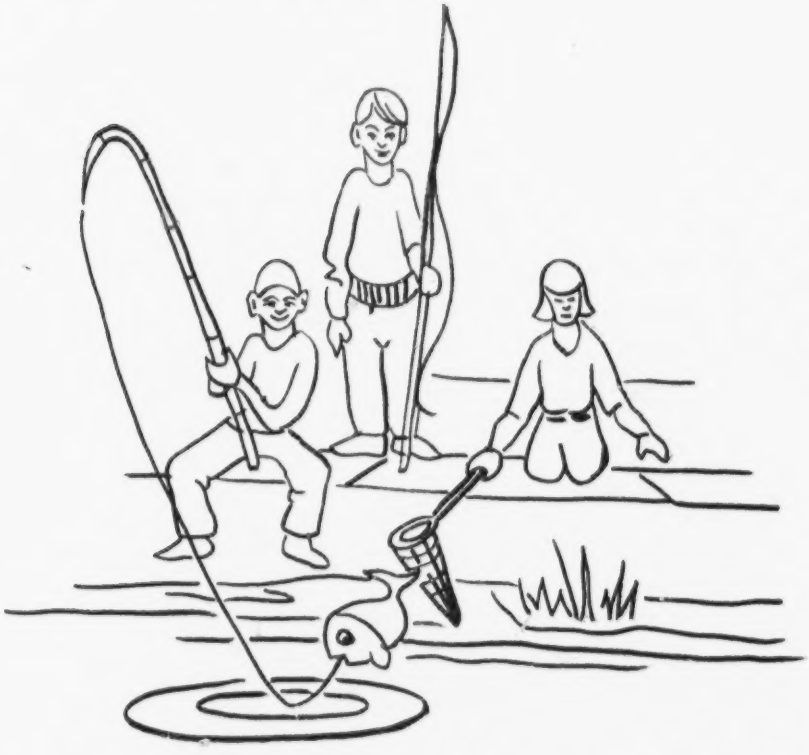
   b. Casting the line
   c. Discussion of safety factor

4. Cane Pole Fishing in Clear Lake

5. Live Demonstration of Cleaning a Fish

6. Post Discussion

   a. Other methods of fishing
   b. Kinds of areas where one may fish
   c. Other kinds of equipment used in fishing
   d. Game laws, licenses, and fishing seasons
   e. Methods of cooking fish



BOATING

A. ACTIVITY RATIONALE

Michigan with its many lakes and streams is one of the leading states in promoting water activities. Fishing, water sports, and other recreational pursuits have made the use of boats commonplace in the state. With increased availability of leisure time, more persons now participate in boating activities than ever before.

Boating as an outdoor skill is appealing to the elementary age child. Most children in the upper elementary grades are physically capable of rowing a boat. However, although most Michigan youth will have the opportunity to take a boat out on open waters, many lack needed skills and the knowledge of safety procedures.

The boating experience at the Outdoor School is designed to provide basic instruction in the use of a rowboat. Emphasis will be placed on skill proficiency and the need for sound safety practices. The experience is also designed to introduce boating as an outdoor skill activity that can be both combined with and expanded into other water activities for recreational purposes that can be pursued over a lifetime.

B. RECOMMENDED GRADE LEVEL

This activity is applicable at either the fifth or sixth grade level.

C. BACKGROUND INFORMATION FOR TEACHERS

Boating instruction is conducted in the cove at Clear Lake north of the lodge. There are ten rowboats with oars attached. The boats contain three seats. They have flat bottoms which make them more stable on the water and difficult to tip. Life preservers are available which must be worn by children at all times when they are in the boats. Boating is not permitted when the lake is rough and whitecaps appear. The Outdoor School maintains a specific set of safety rules. These rules are reviewed for the students by an Outdoor School staff member prior to each time the boats are used.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Spring is a good season for boating activity. However, weather conditions can be a factor. Windy days are usually unsatisfactory as children have difficulty in maneuvering the boats. Boating begins in the spring as soon as the ice leaves the lake and the water warms sufficiently to prevent additional freezing.

E. DESCRIPTIVE OUTLINE OF THE ACTIVITY

1. Orientation For the Activity

   a. Learning the parts of a rowboat

      1. bow
      2. stern
      3. oars
      4. oarlock
      5. gunwhale

   b. Demonstration of boating procedures

      1. Proper way to enter a boat
      2. How to shove off from shore
      3. How to sit in a boat and keep it balanced
      4. Proper way to beach a boat

   c. Demonstration of the methods of rowing

      1. Rowing the boat forward
      2. Rowing the boat backward
      3. Rowing the boat to the right
      4. Rowing the boat to the left

   d. Reviewing the safety rules

      1. Life preservers must be worn while in the boats.
      2. Only one person rows at a time.
      3. No one is permitted to change seats with the rower while the boat is away from shore.
      4. No one is permitted to stand up in a boat when it is away from shore.
      5. Do not lean over the sides of the boat.
      6. Boats must be kept under control and a safe distance from nearby boats.
      7. No unnecessary splashing or horseplay is permitted.

2. Putting on Life Preservers

3. Boating on Clear Lake

   a. Each child demonstrates his ability to operate his boat.

   b. Free boating.

ARTS AND CRAFTS USING NATIVE MATERIALS

A. ACTIVITY RATIONALE

Native materials are ideal for craft work, and they are readily available in the camp setting. Securing craft materials in their native environment may stimulate more creativity and be more relevant to the child than working with prepared materials in the classroom. The creative skills of native arts and crafts are valuable in instilling a feeling of self expression within the individual child as well as providing a feeling of self-accomplishment.

The arts and crafts experience at the outdoor school is designed to directly relate the child's artistic experiences with the out-of-doors. The outdoor environment is presented as a source of many available materials which can be utilized in creative craft projects. The primary focus of children working in the craft room is learning how to use some of the available native materials in this area in arts and crafts projects.

B. RECOMMENDED GRADE LEVEL

This activity is applicable at either the fifth or sixth grade level.

C. BACKGROUND INFORMATION FOR TEACHERS

The outdoor school maintains a craft room in the basement of the lodge. Examples of suggested projects are on display. Children gather native materials in the field before beginning a project. Children choosing to work with clay dig the clay in nearby farm fields. All supplemental materials needed for completing a project are available in the craft room. Tables, benches, and simple tools needed for carrying out the activity are also available. If a project is not completed in the time available, children are encouraged to take the project back to school or home for completion.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Craft projects utilizing wood are the most ideal during the spring. Collages may also be created, although the availability of materials is not as great as in the fall. Clay may be dug in March as soon as the ground thaws unless the ground is too wet.

E. DESCRIPTIVE OUTLINE OF THE ACTIVITY

1. Orientation for the Activity

   a. Becoming acquainted with the facilities of the craft room.

   b. Reviewing the suggested projects that may be pursued.

      1. Clay
         medallions
         masks
         pots
         necklaces
         ear rings

      2. Collages

      3. Wooden jewelry
         ear rings
         medallions
         tikis
         rings

   c. Selecting a project

2. Gathering or selecting materials to be used.

3. Working on a project in the craft room.

COOKING OUT

A. ACTIVITY RATIONALE

Cooking an outdoor meal is a favorite outdoor activity enjoyed by thousands of American families. Building and cooking over the open fire demands more skill than home cooking and a deeper appreciation for outdoor living.

Although one person can successfully conduct his own cookout, this type of activity is more adaptable as a group activity in which each person assumes a role to fulfill to ensure a successful outcome.

The cookout experience at the outdoor school is designed to introduce the cookout to the student as a group activity which demands both needed skills as well as group interaction through teamwork. The activity focuses on the need for careful planning in selecting a site, determining a menu, and exercising safety precaution.

B. RECOMMENDED GRADE LEVEL

This activity is applicable at eitner the fifth or sixth grade level, and it is recommended as an activity to be repeated a second time in a different season by those children who attend the Outdoor School during two consecutive years.

C. BACKGROUND INFORMATION FOR TEACHERS

Children plan a menu for, carry out adequate preparation for, and eat, as a group, a well balanced meal which will fit into the total day's nutritional needs.

Many cookout sites are available in the camp area on both sides of the lake. Children choose a site in accordance with weather conditions and time available. Children ready the site for cooking and gather dead wood in the camp woods for firewood. Food is prepared and packed in the lodge. A supply room for cookout equipment is maintained in the basement of the lodge.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Whereas cookouts are conducted throughout the year, spring as a season has no special significance. Weather is the only critical factor due to the probabilty of rain. However, cookouts are conducted regularly except on extremely rainy days.

E. DESCRIPTIVE OUTLINE OF THE ACTIVITY

1. Organizing for the Cookout

   a. Selecting a balanced diet

      1. meat
      2. vegetable
      3. salad
      4. beverage
      5. dessert

   b. Determining needed equipment
   c. Preparing the food
   d. Packing needed equipment

2. Choosing and preparing the site

3. Cooking the meal

4. Cleaning up the site

5. Returning and cleaning equipment

6. Post activity discussion at the Outdoor School

   a. How successful was the activity?
   b. How well did the class work together as a group?
   c. What skills are important for the success of the activity?

ORIENTEERING ON A COMPASS COURSE

A. ACTIVITY RATIONALE

The compass is a fascinating instrument which captures the interest of children. Although the use of the compass can be adequately learned at school or home, its use is more meaningful in an outdoor environment where space is plentiful.

The use of the compass is of prime interest to persons engaging in many outdoor activities. Persons who participate in camping, hiking, hunting, and fishing find the compass a valuable tool.

The experience in orienteering on a compass course at the outdoor school is designed to teach the student the skill of using a compass and introduce him to the art of pacing. This activity should be presented to the student as one of many recreational activities involving the use of a compass that can be pursued over a lifetime.

B. RECOMMENDED GRADE LEVEL

Recognizing that this activity involves some mathematical skill that can best be performed by the more mature student, this activity is recommended for sixth grade students.

C. BACKGROUND INFORMATION FOR TEACHERS

The outdoor school maintains a compass course on a level field area adjacent to the west side of Mystery Swamp. A series of permanently marked stakes are strategically placed at measured intervals. Pacing is taught on the course. Children work in pairs. The main function of the activity is to follow a set of written directions which indicates a series of distances and directions the students are expected to follow to various locations (stakes) on the course. When the students complete one set of directions, they check their answers for accuracy with the instructor and then proceed to a new set of directions. The compass course is large enough to permit an entire class to work simultaneously. Compasses, clipboards, pencils, and printed materials are provided by the Outdoor School.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

This activity is dependent upon good weather conditions. Rainy and/or cold days in early spring are prohibitive. However, the activity can be conducted throughout the spring whenever warm days prevail.

E. DESCRIPTIVE OUTLINE OF THE ACTIVITY

1. Indoor Orientation

   a. Discussion on the compass

      1. History of the compass
      2. Principle of the compass
      3. Theory of magnetism

   b. What is a compass course?

   c. What is pacing?

2. Outdoor Orientation

   a. Demonstration - how to use the compass on the course
   b. Demonstration - determining one's pace
   c. Demonstration - following a set of directions on the course

3. Determining each student's pace

4. Working on the course

5. Post activity discussion

   a. How successful was the activity?
   b. How does one construct a compass course?
   c. What are other related compass activities?

EDUCATION
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VISIT TO A DAIRY FARM

A. ACTIVITY RATIONALE

Dairy farming has long been one of the integral land uses in southern Michigan, and milk as a product is a prime example of man's dependence upon the land as a source of food for his existence. In earlier years dairy cattle production was a part of the operation of the "general" farm. However, in this era of specialization larger specialized dairy farms have emerged as a result of the gradual disappearance of the smaller "general" farms. The story of milk production is particularly fascinating to children who are the prime consumers of the product and its byproducts. This activity is designed to provide children with an understanding of all aspects of dairy farming and demonstrate the importance of the role that dairy farming plays in our lives.

B. RECOMMENDED GRADE LEVEL

This is not a sequential activity, and it can be pursued at either grade level.

C. BACKGROUND INFORMATION FOR TEACHERS

The dairy farm is located along M-37 about ½ mile south of the entrance road to the Outdoor Education Center. The entire acreage of the farm is devoted to the practice of modern dairy farming. The farmer maintains a herd of over 40 milking cows. Usually there are calves and young heifers in the barn.

The barn is large and is kept in clean condition providing an opportunity for children to view all the functions of the dairy farm. Hay is stored in the upper level of the barn; a modern silo filled with silage adjoins the building. Fresh milk is stored in a bulk cooler in a separate room along with automatic milking equipment.

Farm machinery is stored in adjacent buildings.

During the growing season the cows are pastured in some of the adjacent fields, while feed crops such as hay and corn are grown in other fields.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Dairy farming is a continual operation; however, routine daily activity is partially seasonal in nature. A visit to the farm during the spring season should also focus on the gradual transition in activity that becomes evident as the winter operation declines and the summer operation approaches.

E. DESCRIPTION OF ACTIVITY

The following outline for the activity is suggested

1. Orientation at the Outdoor School

    a. Establish rationale for the visit
    b. Outline details of the hike
    c. Establish behavioral expectations while visiting the site

2. Explore the barn yard

    a. Observe cattle: number present, various ages, kind of cattle
    b. Observe feeding areas and kinds of food
    c. Discuss special physiological features of the cow (cud chewing, two stomachs, etc.)
    d. Observe the silo and its contents

3. Explore the lower level of the barn

    a. Observe young calves and their food
    b. Observe and identify the mechanized milking equipment
    c. Observe the stanchions, watering system, and feeding troughs
    d. Observe the milk room and the bulk cooling and storage tank

4. Explore the upper level of the barn

    a. Observe hay and hay storage area
    b. Observe ropes and pulleys for storing and removing hay
    c. Observe equipment stored here
    d. Observe other foods stored in the area

5. Note and determine use of other farm buildings

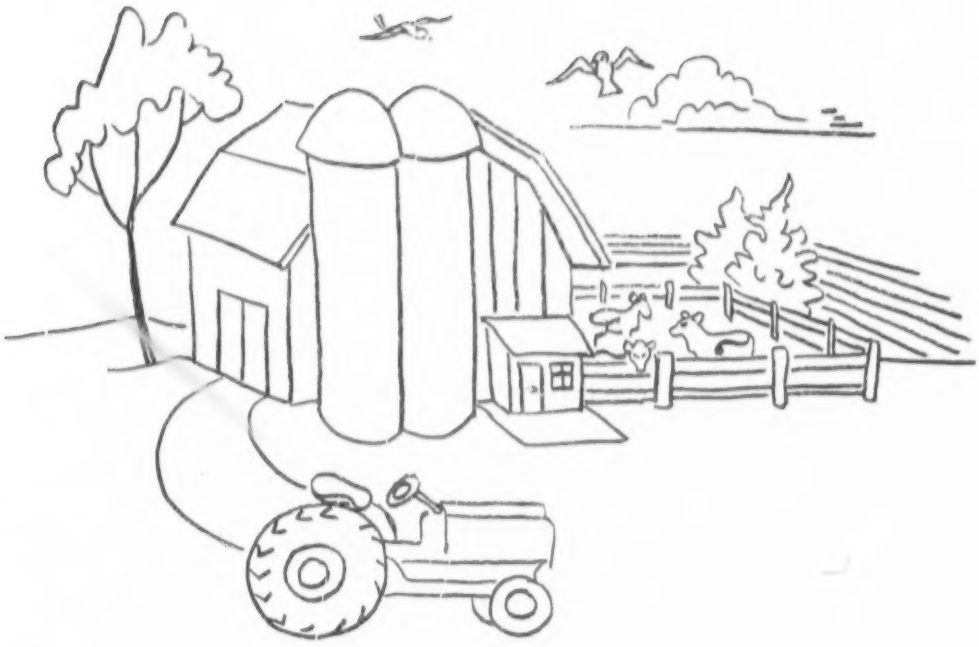
    a. Pole barn
    b. Tractor shed
    c. Tool shed

6. Explore adjacent farm fields and note land uses

    a. Fields used for pasture
    b. Fields where hay is grown
    c. Fields where grain crops are grown

7. Post activity discussion at the Outdoor School

   a. Effect of dairy farming on our lives
   b. Implications of mechanization to farming
   c. Different breeds of dairy cattle (illustrate) with slides)
   d. How the various kinds of machinery operate (illustrate with slides)
   e. Importance of cleanliness in dairy farming
   f. How the seasons and weather affect dairy farming
   g. Transportation and marketing of milk (illustrate with slides)



VISIT TO A BEEF FARM

A. ACTIVITY RATIONALE

Beef cattle production is now an integral part of Michigan agriculture; within recent years there has been a sharp increase in the number of Michigan farms specializing in beef cattle production and a corresponding sharp decline in the number of "general" farms which were once more characteristic of rural areas. Despite this change man, who now exists primarily in an urban environment, is even more dependent upon this phase of agriculture for his existence. This activity is designed to acquaint children with an operation as it exists on a typical southern Michigan farm and indicate its relationship to man's dependence upon the land for his own existence.

B. SUGGESTED GRADE LEVEL

This is not a sequential activity and it can be pursued at either grade level.

C. BACKGROUND INFORMATION FOR TEACHERS

The beef farm is located along M-37 adjoining the boundary of the Outdoor Education Center. The farm extends over 600 acres in separated parcels of land on both sides of Clear Lake. The farm buildings have been converted from a "general" farm into a highly specialized operation.

During the later part of the fall season the farmer buys young calves to raise and market when ready for slaughter. There are usually about 125 head in the herd. The cattle are usually kept about one year, being marketed early in the fall season.

Much of the feed for the animals is raised on the farm. Corn is cut as Silage and stored in the silo. Hay is stored in the barn.

The cattle are housed in the lower part of the barn and in adjacent pens. During the fall season the young stock often graze over harvested fields. During the winter season they are confined to the barn and the barnyard.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Weather is not a factor; the farm may be visited anytime. The animals are usually housed in pens adjacent to the barnyard during the spring.

E. DESCRIPTIVE OUTLINE OF THE ACTIVITY

1. Orientation to the Activity

   a. What are beef cattle?
      1. various breeds
      2. relationship to man's existence

   b. What is a specialized farm?

2. Hiking to the Farm

3. Observing the Cattle

4. Observing the Buildings and Pens

   a. Types of feed grains stored
   b. Other types of feed stored
   c. The silos
   d. Shelter for animals
   e. Equipment sheds and stored machinery

5. Observing Nearby Fields

   a. Apparent use
   b. Estimating the acreage
   c. Examining the soil and topography and its effect on the farm operation

6. Post Activity Discussion at the Outdoor School

   a. Implications of mechanization to this type of farming.
   b. Beef cattle, what a year of their life is like
      1. feeding methods
      2. meat production

   c. Evidence of good and poor farming practices
   d. Relationship of this type of farming to the seasons and weather
   e. Transportation and marketing of stock
   f. The government and farming
   g. Importance to man of this type of farming

PREHISTORIC LIFE IN MICHIGAN-
A FOSSIL DIG IN BARRY COUNTY

A. ACTIVITY RATIONALE

Man's place, historically speaking, in the whole development scheme of the planet on which he lives, has always been a fascinating subject to explore.

Within recent years, the geological sciences have made tremendous contributions to our knowledge of the development of life on earth over the last two billion years.

Elementary children have already been "tuned in" to some of this knowledge as evidenced by their universal interest in dinosaurs, etc.

The "Fossil Dig" experience at the Outdoor School is designed to broaden the students' concept of "life in the past" through a combination of laboratory and field work with invertebrate fossils that can be found in Barry County.

B. RECOMMENDED GRADE LEVEL

This activity is designed to be the first of two exploratory trips to a gravel pit and is recommended for fifth grade students.

C. BACKGROUND INFORMATION FOR TEACHERS

During the last 500 million years, Michigan has been covered several times by ancient seas. The sea bottom during each period of indunation served as a collecting surface and agency for the preservation, through fossilation, of many of the now extinct life forms that lived in the warm shallow seas of those past geologic periods.

After the seas disappeared for the last time, about 240 million years ago, the great limestone, sandstone and shale beds, formerly sea bottom material and now solid bedrock, were exposed to the air. During the millions of years that followed, these rock beds were eroded, layer by layer, freeing and destroying the enclosed fossil remains along with the rock into the Michigan landscape as it appeared about one million years ago.

At that time, a new erosive force developed--the first of four great ice sheets swept down from the north tearing off large amounts of the ancient sea bottom bedrock. As this bedrock material was carried south by the ice and glacial meltwater, the large pieces were worked into increasingly smaller pieces. A heterogeneous mixture of sand, gravel and clay was finally produced and eventually spread over the entire state as the last ice sheet retreated back to the north about 10,000 years ago.

We find fragments of fossil remains in this glacial till freed from the original bedrock layers that preserved them millions of years earlier.

The glacial till covers the lower peninsula of Michigan to an average depth of 150 feet and contains rock, mineral and fossil representatives from many geologic periods spanning hundreds of millions of years.

Students will have an opportunity to make some first-hand observations on the fossils contained in the glacial till as they go on a "Fossil Dig" in a gravel pit near Clear Lake.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Spring is a good season for exploration in a gravel pit. Early in the season after winter snows have first melted, exploration can be difficult. But as the season progresses, conditions steadily improve, and exploration becomes easy. However, due to the nature of the activity, fossil hunting is not associated with any specific season.

E. DESCRIPTION OF ACTIVITY

ROCK LAB ORIENTATION

1. Use nautiloid fossil as a "mystery rock found in a creek bottom" to introduce activity - create complete drawing of nautiloid specimen as children try to match drawing with geologic period pictures on the Rock Lab time line.

2. Discuss time line - extend line back to hypothetical beginning of the earth (8 times around the room).

3. Use transparency CID 21 - have children match pictures on visual with geologic time period on time line. Point out the rise and fall of animal groups.

4. Develop idea that the time line animal and plant information was constructed on the basis of fossil evidence found in the rocks of different ages--show several fossils--emphasize fragmentary nature.

5. Use transparency CID 22 to show that whole animals are not always found--parts indicated are most commonly found.

6. Let children have some experience with some fossils they can hold--distribute green boxes, one box per two children. Let students examine specimens for a moment.

7. Now ask class to examine their individual specimens and in timed intervals have them do the following:

   a. count the number of fossils on their hand specimen.
   b. count the <u>different</u> kinds of fossils on their hand specimen.
   c. match any fossil on their hand specimen with a geologic period on time chart.

8. Students should now be interested in searching the glacial till for some fossils they can find themselves.

9. Suggest that, before they go on a "Fossil Dig" near Clear Lake, they should know whether or not any ancient seas covered Michigan to produce some fossil beds.

Show filmstrip "The Story Fossils Tell" frame #25 and 26---pictures areas of North America covered by ancient seas.

10. Organize for field work--each child should bring back 4 or 5 hand specimens for examining in the Rock Lab. In addition, each team should have a rock hammer and collecting satchel or box and a pocket magnifier.

FIELD STUDY

1. Organize students by teams--cover ground rules for safe behavior in pit--encourage a lot of exploratory activity.

2. Do not discuss rock types with students--this is a "fossil dig"--keep students thinking fossils.

3. Each time a student finds a fossil, announce the find to the rest of the class to encourage greater activity.

4. Teacher should not pass judgment in the field on whether or not rocks shown by the students are fossils--this judgment is to be made back in the lab. General encouragement should be given to take back all "suspect rocks".

ROCK LAB FOLLOWUP

1. Have children use (10%) <u>acid</u> <u>test</u> to begin fossil identification procedures.

   a. Divide specimens into two groups:
      Group 1. rocks that fizz (bubble)
      Group 2. rocks that do not fizz (bubble)
   b. Examine group 1 rocks very carefully---compare any shapes or patterns on the specimens with fossil identification book. pp. 81-132

2. Children that do not have any group 1 rocks can examine the rock lab fossil bucket.

FOR THE CLASSROOM TEACHER

F. SUGGESTED CLASSROOM ORIENTATION ACTIVITIES (PRE-OUTDOOR SCHOOL)

Activity One - Recognizing A Fossil In A Rock

1. Obtain traveling fossil collection from the Kingman Museum (te. 5-5715).

2. Have students look at some of the specimens to determine the following:

   a. Is the fossil a cast, print or original animal?
   b. Which part of the animal is visible: the shell skeleton, teeth, or other parts?
   c. Is the fossil complete or only part of the animal or plant?
   d. Is the fossil made of the same kind of material as the rock in which it is found?

Activity Two - How Fossils are Formed

1. Obtain "Fossils Filmstrip-Record" from A-V Department (tel. Ext. 231) and use filmstrip 10951 C SD.

2. By using the filmstrip, the teacher will be able to provide students with information on the following:

   a. Identification of a fossil.
   b. Conditions necessary for fossilization to occur.
   c. Why most organisms do not become fossils.

G. SUGGESTED CLASSROOM FOLLOWUP ACTIVITIES (POST-OUTDOOR SCHOOL)

Activity One - Filmstrip Viewing and Discussion for More Information on Fossils

1. Additional information you may wish to develop about fossils:

   a. How fossils are formed.
   b. Fossils and organic change.
   c. Fossils and prehistoric environments.
   d. Collecting and interpreting fossils.

2. To develop this information, use the "Fossils" filmstrip available from the A-V Department (tel. Ext. 231)

H. GENERAL BIBIOGRAPHY OF LOCAL MATERIALS

1. Audio-Visual (tel. 962-5581, Ext. 231)

a. Age of Mammals (fs)
b. Beginning of Life (fs)
c. Coming of Reptiles (fs)
d. Dinosaur Age (F)
e. Discovering Fossils (fs)
f. Fossils are Interesting (F)
g. Rise of Dinosaurs (fs)
h. Stories Fossils Tell (fs)
i. Triumph of Dinosaurs (fs)

2. Books - School Services Department, Willard Library

a. They Turned to Stone
b. Wonders of Fossils
c. Fossils
d. The Real Book About Prehistoric Life
e. The Age of Reptiles
f. All About Dinosaurs
g. All About Strange Beasts of the Past
h. Dinosaurs
i. Discovering Dinosaurs
j. Famous Fossil Finds
k. The True Book of Dinosaurs
l. Prehistoric World
m. Life Through the Ages
n. Monsters of Old Los Angeles
o. Animals of Yesteryear
p. What is a Dinosaur

DISCOVERING MICHIGAN ROCKS

A. ACTIVITY RATIONALE

Rocks have always been an important part of man's environment. The soil contains rock particles; the mountains are made of solid rock; and sanddunes and seashores are collections of rock grains. The city streets and buildings use rocks in the glass, concrete, asphalt, bricks, and other materials used in building modern cities.

We sprinkle rocks (salt) on our food, brush our teeth with rocks (diatomaceous earth), and even wear rocks (jewelry and specialized clothing).

The "Discovering Michigan Rocks" activity at the Outdoor School is designed to broaden the student's ideas about the varieties of Michigan rocks, their characteristics, where they come from, and how they are useful to man.

B. RECOMMENDED GRADE LEVEL

This activity is applicable at either the fifth or sixth grade level for students from non-Battle Creek district schools.

C. BACKGROUND INFORMATION FOR TEACHERS

The earth is essentially a "ball of rock", covered with a relatively thin layer of clay, sand, silt, gravel, boulders, organic debris, and other materials in all kinds of mixtures. This thin layer covers about 3/4 of the earth's surface.

All of these materials came originally from the "solid rock" of our planet. Running water, gravity, wind, freezing and thawing, chemical weathering, volcanic activity, earthquakes and glaciers are some of the geologic processes that remove rock from the "original ball" to form the thin surface layer we live on.

In addition to the forces that remove rock from the original "solid ball", other geologic processes are at work that create "new rock" on top of the original rock. These rocks are usually formed as small rock particles and are dropped to the bottom of bodies of water in the form of mud, sand, or minerals leaving the water.

Rocks that are formed in the interior of the earth at high temperature or from molted materials, are called IGNEOUS ROCKS. Igneous rocks that move towards the surface but harden before they get there are often associated with metal ores. Common rocks and minerals in this category are granite, feldspar, mica, quartz, pegmatites, syenite, diorite, and gabbro.

Igneous rocks that break out at the surface in the form of lava from fissures and volcanos are commonly represented by rhyolite, obsidian, pumice, andesite scoria, and basalt. Basalt is common in Michigan particularly in the western end of the upper peninsula.

Rocks that are formed by the action of wind and water or organic agents are called SEDIMENTARY ROCKS. These rocks are formed as the original igneous rocks are reworked. Examples would be limestones, shales, coal beds, sandstones, salt beds, conglomerates, concretions, breccias, and bog iron ores.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Spring is a good season for exploration in a gravel pit. Early in the season after winter snows have first melted, exploration can be difficult. But as the season progresses, conditions steadily improve, and exploration becomes easy. However, due to the nature of the activity, rock hunting is not associated with any specific season.

FOR THE OUTDOOR SCHOOL TEACHER

E. DESCRIPTION OF ACTIVITY

ROCK LAB ORIENTATION

1. Draw a 4' diameter circle on the board. Tell students this represents a rocky ball called earth. Have several students make a mark on the ball to show how deep they think man has explored.

2. Show students actual depth of penetration ---- make a barely visible mark with a piece of chalk to represent the deepest oil well. Discuss our lack of knowledge, from direct observation, of most of the rocks of the earth.

3. Show students a piece of rock (granite). Tell them this rock was found laying on the outer thin layer of the earth; have them guess its age in years.

   Compare with: the turn of the century
   the landing of the Pilgrims
   the birth of Christ
   the age of Dinosaurs
   etc.

   Have students put some numbers on the board they think represents the age of rock.

   Write the actual minimal age of the rock (in excess of 1,000,000,000 years) on the board and use an analogy to illustrate the length of a billion years period of time in terms students can understand.

   Tell students we can not only tell how old rocks are by looking at them, but we can also tell where they came from and how they were formed.

4. Pass out a collection of rocks (sandstone, limestone, granite, gneiss, basalt, and quartz) to every two students.

   Tell students they, too, can begin to learn to "read the story" a rock can tell, by looking at their own samples---hold up a piece of gneiss---have each student team select the same piece and tell you all they can observe in a few seconds.

Try the same thing with the quartz speciman---develop the notion that rocks with only one color probably have just one chemical in them and are called minerals. Rocks that have more than one color probably have a mineral (chemical) for each color and are called rocks.

Have students separate the rocks from the minerals in their sample collection.

5. Tell students at least two of their rock samples came from the ocean bottom, one came from the molted interior of the earth, and one poured out of a volcano.

   To illustrate this show transparency CID-17.

   Relate the characteristics of the student's samples to the visual presentation.

6. Tell the students they are going to take a geology trip 40' down into the surface of Barry county to look at the rocks.

   The object of the trip will be to collect and look at enough rocks to determine how or where the rocks of Michigan were made.

7. Put the following words on the board----volcano, ocean bottom, earth's interior, beach, stream bottom, etc. Have class predict which kind of place, the rocks they will find, were formed.

8. Organize for field work---each child should bring back 4 or 5 hand specimens for examining in the rock lab. In addition, each team should have the following in the field; a rock hammer, a collecting bag, a pocket magnifier, and a field guide sheet.

FIELD STUDY

1. Organize students by teams----cover ground rules for safe behavior in pit. Encourage a lot of exploratory activity.

2. Do not discuss fossils with students----this is a "rock hunt"---keep students thinking rocks and their origins.

3. Each time a student names a rock or its origin, announce the find to the rest of the class to encourage greater activity.

4. Teacher should not pass judgment in the field on whether or not the rocks shown by the students are correctly identified. General encouragement should be given to take back all "supect" rocks.

5. Give each student a copy of the Rock Field Guide (see page S-34) to aid in identifying the names of some of the common igneous and metamorphic rocks.

ROCK LAB FOLLOWUP

1. Give one rock test kit and one rock manual to each student team.

   Proceed with directions for using manuals and test kits.

2. Discuss results with students as they investigate in terms of identifying rocks by their colors, hardness, streak, and dissolving power; place emphasis on observation and testing rather than finding the "right answer".

3. Encourage students to use the electric board to check real specimens for rock names and origins.

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"Discovering Michigan Rocks"

A ROCK FIELD GUIDE

If your rock is very hard, light-colored, dark colored or has several colors, or has many tiny crystal grains, IT IS PROBABLY AN IGNEOUS ROCK:

If your rock is soft to medium hard, one color, or if it looks like a mass of pebbles, IT IS PROBABLY A SEDIMENTARY ROCK:

- - - -

DROP OFF HIKE

A. ACTIVITY RATIONALE

An interesting problem situation which provides an excellent climate for teaching certain meaningful concepts is "being lost". "Being lost" is generally accepted as a common problem which one might expect to encounter. Although road maps are readily available for use while traveling, many persons lack skill in properly using them. Also, many persons fail to recognize the need for discovering available clues to be used as a means of problem solving when one "is lost".

The approach to instruction centering around appropriate uses of the road map and compass should be a problem solving approach in which the students are actively involved. For th most effective instruction they should be faced with the need to solve the problem.

The Drop-off Hike is designed to provide children with a simulated experience of being lost. They must treat the experience as a problem to be solved collectively by a small group of students through the process of gathering data as they use available equipment (maps and compasses) and observe available clues.

B. RECOMMENDED GRADE LEVEL

This activity is designed to be the first of two experiences involving instruction in the use of the compass. Out-of-district students may participate at either the fifth or sixth grade level.

C. BACKGROUND INFORMATION FOR TEACHERS

With the aid of compasses and county road maps the children attempt to find their way back to Clear Lake from an unknown point several miles distant from the camp area. In preparation for and execution of the activity the following format is usually followed:

1. In an outdoor sdhool classroom the outdoor school teacher conducts an orientation which acquaints children with the purpose of the

activity, the procedure to be followed, and the correct methods of using a map and a compass.

2. The children are divided into small groups for the hike with either a teacher or counselor being assigned to accompany each group.

3. Each group of children is transported away from the camp area by bus and is "dropped off" at a different point.

4. Utilizing newly acquired skills each group attempts to solve the basic problem at hand, i.e. finding their way back to camp.

Compasses, clipboards, pencils, and printed materials are provided by the Outdoor School.

Most groups of children successfully complete the activity by hiking back to the camp area. Those groups which are not able to successfully locate themselves and hike back within the allotted time period are transported back to the camp area.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Spring is an ideal season for hiking and drop-off hikes can be conducted anytime except during inclement weather.

E. DESCRIPTIVE OUTLINE OF THE ACTIVITY

1. Orientation for the Activity

a. Discuss the purpose of the activity

1. Describe the activity to the children.
2. Have children realize that "being lost" is a problem.
3. Have children realize that the problem can be solved.
4. Have children realize the importance of the map and compass in solving the problem.

b. Divide the students into small groups.

c. How to use a compass

1. We are using a Silva compass with a "direction of travel" indicator.

2. The compass has a magnetized needle, the tip of which is painted red.

3. The needle is normally attracted to ("points to") the north by the earth's magnetism.

4. In order to achieve an accurate reading the compass should be held level.

5. The compass should not be used near other objects which are highly magnetized such as telephone and electric wires.

6. Distribute compasses to children for practice usage.

7. To orient the compass and find north: hold the compass level until the needle stops rotating; then rotate the housing until the letter N on top of the housing coincides with the red tip of the needle.

8. To discover other directions: hold the compass level with the needle and the letter N on the housing pointing to the north; the other letters on top of the housing now point to the three remaining major directions (east, south, west).

9. To find the direction of specific points (for example, the directions that a road runs): face the point or object with the plastic "direction of travel" arrow pointing toward it; turn the compass housing until the red end of the magnetic needle points to the letter N on the housing; the "direction of travel" arrow now coincides with the actual direction you are facing.

3

10. To find a predetermined direction for example - WEST, using a Silva compass: set the needle housing so that the letter W coincides with the "direction of travel" arrow; hold the compass with the "direction of travel" arrow pointing straight in front of you; turn on your feet until the red end of the magnetic needle coincides with the letter N on the housing. At this point you are facing the desired direction, WEST.

d. How to Use A Road Map

1. The top of the map is North unless indicated otherwise on the map.

2. The map has a legend which indicates the symbols used to represent various types of roads and features shown on the map.

3. The map has a scale of miles which indicates in inches the amount of space represented on the map by one mile.

4. Natural features such as lakes and streams are shown on the map.

e. Distribute a map to each group.

f. Have the students locate Clear Lake.

g. Have the students spot the location of the camp and determine the direction of the camp from highway M-37.

h. Realizing that they will be dropped off within four miles from the camp, have the students use the scale of miles and determine on the map the approximate area in which they will be hiking.

i. Have the students check the legend and determine the kinds of roads that exist within the four mile radius of Clear Lake.

j. Have the students look for symbols on the map within the four mile radius and check the legend to discover their meaning.

k. Describe a theoretical "drop-off" point in detail and have the students attempt to locate the point on their maps.

l. Tell children they are now adequately prepared to venture into the field and "become lost".

m. Remind the children that they, not the adult accompanying them, are expected to make the decisions necessary for solving the problem and returning safely to camp.

n. Review the rules to be followed (see page S-40)

o. Explain to the students that when they return to camp they are expected to summarize their progress (see page S-43).

2. Performing the Activity

a. Each group of children is taken by bus to their drop-off point.

b. Students make observations and decisions in their small groups and begin hiking back to camp.

c. The adult supervisor provides the necessary guidance (see page S-41).

3. Post-hike Activity

a. As each group returns to the outdoor school classroom they should be given a summary sheet to complete.

b. Whenever time is available, each group should be given the opportunity to summarize verbally for the rest of the class the success of the activity.

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Rules For Hiking - Drop-off Hike

1. The group must stay together in single file.

2. You should hike on the left side of the road, facing oncoming traffic; hike as far to the left as possible without trespassing on private property.

3. Stay along the roadside; do not go on lawns or around houses, barns, etc. Never take shortcuts across private property.

4. If it is necessary to cross highway M-37, cross together in a group; do not cross in the single file line.

5. Do not allow dogs or other animals to hike along with the group.

6. If it is necessary to use a telephone, only the adult should go to the house; the students should remain together in the driveway.

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Guidelines For Adult Supervisors On Drop-off Hikes

1. Organize the group after disembarking from the bus:

   A. Designate a student as the compass reader.

   B. Designate a student as the map reader.

   C. Designate the other students as "scouts" responsible for discovering clues.

2. Keep the group stationary; do not allow any "off-the-cuff" decisions to be made by members of the group.

3. Establish with the children a procedure for the first group decision:

   A. Have children recall the simulated experience during the orientation in which they located a point on the map using available clues. Apply that experience to the present situation.

   B. Have the compass reader tell the direction of the road.

   C. Have the scouts report all available clues they have discovered. (type of road, intersections, bodies of water, road signs etc.)

   D. Have the map reader (with help of some other students) determine if enough clues are available to locate their position on the map.

      1. If the group feels it has enough information to make a decision, allow the decision to be made; insist that the decision be made by a majority of the group.

      2. If the group feels it doesn't have enough information to locate itself at this point, then allow the children to make an arbitrary decision to begin hiking until they are able to find more information.

4. The succeeding group decisions should be accomplished in similar fashion. Insist that all decisions be made by a majority of the students.

5. Alert the students periodically of the necessity of checking their progress as new clues become available.

6. Remember you are responsible for seeing that the students follow the rules established for the hike.

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DROP OFF HIKE SUMMARY

1. How far did you walk? _____

2. How long did you walk? _____

3. What was your average speed? (Divide the number of hours you walked into the number of miles you walked.)

_____

4. What was your general direction from camp when you were dropped off?

_____

5. Name the roads you walked on: _____

_____

6. On the back of this paper, draw a map of the route you took (include the names of roads and types of roads and other symbols you learned).

7. List at least three (3) interesting things that you did, saw, smelled, touched or heard on this hike.

_____

_____

_____

_____

_____
(name)

UNDERSTANDING OUR ENVIRONMENT-
EXPLORING IN THE CEDAR CREEK WATERSHED

A. ACTIVITY RATIONALE

Within the boundaries of the forested Cedar Creek drainage basin nearly all types of surface features, plant cover, and animal life typical of southern Michigan can be observed directly by students.

Ecological relationships important to the management and wise use of our forest lands and the animal communities they support can be developed in this kind of setting.

This activity is designed to afford children an opportunity to explore a landscape characteristic of much of the southern half of the lower peninsula of Michigan where early farming and logging methods ruined the hilly land for agricultural use. The land has since been planted in part as a tree farm whereas the remainder has been abandoned to a natural plant succession of mixed hardwood trees and shrubs.

B. RECOMMENDED GRADE LEVEL

This activity is applicable at either the fifth or sixth grade level.

C. BACKGROUND INFORMATION FOR TEACHERS

The portion of the Cedar Creek watershed students will explore is an area of glacial moraines and low lying wetlands covered with second growth stands of mixed hardwoods and planted conifers.

Cedar Creek forms the northwestern boundary of the area, lying in a sinuous, narrow, swampy, valley. Yellow poplar, river birch, and tamarack grow in the boggy bottomland in the creek valley.

Aspen, sumac, and black cherry, the first generation of abandoned field succession trees, are mixed in and around the planted stands of jack, red, and white pines.

The small lakes and ponds in the area support a variety of aquatic life including a sizeable muskrat colony and a normal complement of ducks and wading birds.

An abandoned home site on the east side of the area, recognizable from foundation ruins and floral escapes, provides evidence for related interpretation of the area.

A climax forest stand of beech trees, 70-80 years old, grows on the northwest side of a large, well defined, glacial deposit near the creek.

Along the sandy bluffs of the creek valley many springs bubble upward carrying ground water to the creek from the uplands to the east.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Spring is an ideal season for hiking in the Cedar Creek watershed area. Even on rainy or cold days the area is suitable for hiking and exploration, as the heavy timber growth combined with the hills and valley protects the hiker from the elements of the weather.

E. DESCRIPTION OF THE ACTIVITY

Indoor Orientation

1. The orientation should be brief. Using a county road map and/or a topographic map of the area, point out to the children the area in which they will be exploring and indicate its approximate distance from the camp by bus.

2. Distribute one copy of a map, Cedar Creek Watershed Exploration Area, (see page S60) and a clipboard to each student.

   Indicate to the students that as they hike along the trail they will be stopping at most of the following interesting areas:

   SENTINAL OAK

   WHITE PINE STAND

   DEAD ELM AVENUE

   THE PONDS

   PINEY UPLANDS

   PEEPER POND

   CEDAR CREEK BLUFF SPRINGS

HOGBACK RIDGE

BEECH HOLLOW

ABANDONED HOME SITE

3. Develop the following key questions and indicate that the answers will be discussed at the conclusion of the activity:

   a. What evidence can you find for the original use and misuse of the Cedar Creek area by the early settlers?
      1. topsoil is gone
      2. house site is abandoned
      3. nearly all second growth timber, even on steep hillsides
      4. fenced areas suggest cattle and cleared land

   b. Are the present owners managing the land in a wise and useful way?
      1. tree farming
      2. abundance of wildlife
      3. recreational use

   c. Can you find evidence that the area now supports a large wildlife community?
      1. adequate cover for mammals, birds, reptiles, and amphibians
      2. natural food supply
      3. evidence of animals-burrows, lodges, drillings, scats, tracks, gnawings, etc.

   d. If you could do anything you wished, what would you do to make the area more useful than it is now?

FIELD STUDY

After disembarking from the bus, help the children orient themselves on their maps and begin hiking to Sentinel Oak. Following is a description of each of the learning resource areas the children will be

visiting along the trail and a listing of suggested questions to explore with the students.

1. Sentinal Oak

A very large white oak growing just beyound the saw mill on the north side of the lane. White oaks grow very slowly. This tree is probably over 100 years old.

White oak was a favorite wood of the Michigan pioneers because it was very strong and resisted decay. The decay resistant qualities made the wood useful for shingles and fence posts.

Questions To Explore

A. HOW BIG IS A BIG TREE?

Have children grasp hands and measure the tree with a living rope. How many "people units" are in the circumference. Compare the oak's circumference with other trees students will see throughout the area.

B. WHAT EVIDENCE DOES THE TREE OFFER FOR TELLING THE "USE HISTORY" SINCE THE CIVIL WAR OF THE IMMEDIATELY SURROUNDING LAND?

Look at the general shape of the tree. Are branches concentrated near the top or are they spread all over the trunk?

C. DO WHITE OAK TREES GROW NATURALLY IN THIS AREA; IS THERE ANY EVIDENCE THE WHITE OAK IS REPRODUCING?

Have students look for "oak seeds" (acorns) or seedling oaks growing under the tree or nearby.

D. WHY HAS THIS VALUABLE WHITE OAK ESCAPED THE SAWMILL FOR THE LAST 25 YEARS?

Compare the logs in the sawmill yard with the white oak trunk. Look for differences that might make the tree undesirable for lumber.

2. White Pine Stand

This is a thirty acre stand of planted eastern white pine trees. The white pine is the "state tree" of Michigan. Between 1840 and 1880 the white pine logging industry of Michigan supplied lumber for over 80% of the homes built in the upper midwest.

Relatively few virgin or original white pines now exist in the state, even though much of Michigan was once covered with dense stands of this magnificent coniferous tree.

The white pine is so-named because of its smooth, easily worked, white wood. The tree is readily recognized by its long, silky needles, arranged in clusters of five, and the smooth, dark gray bark on the upper trunk.

Questions To Explore:

A. IS THE WHITE PINE STAND A NATURAL FOREST, OR HAS IT BEEN PLANTED?

Have students observe tree spacings and locations. Compare with the coniferous growth just to the east of the grove.

B. HOW OLD IS THE PINE GROVE?

Have students compare tree height and trunk diameters with the Sentinel Oak (100 years old.) On the basis of their comparison students should make an educated guess.

Show students how to "age a pine tree" by counting the number of whorls of branches between the ground and the top of the tree. A young white pine by the dead elms is useful for this activity.

C. HOW MANY YEARS WILL PROBABLY NEED TO PASS BEFORE THE WHITE PINES WOULD BE USEFUL FOR LUMBER?

Compare the standing white pine log size with those logs lying in the sawmill yard. Based on the current age of the white pines, the current trunk size, and the saw log trunk diameters, extrapolate the approximate age of the white pines when they would be good marketable timber.

Relate this number to the age of the students when the trees will be mature. Emphasize the time period required to renew forest resources.

D. WHAT IS UNUSUAL ABOUT THE FOREST UNDERSTORY IN THE PINE STAND AS COMPARED TO A DECIDUOUS FOREST?

Compare the distance students can see across the pine stand to the same distance students can see in nearby deciduous forests.

What makes the difference?

Look at the forest floor cover. How is this material related to a "clean understory"?

Tell students they will explore a coniferous forest floor in more detail in another part of the area, to answer the question.

E. IS THERE ANY EVIDENCE THAT MAN HAS BEEN "FARMING THIS FOREST"?

Have students look at lower tree trunks; should tree limbs be growing there? Did they fall off? Were they cut off? Is there evidence on the ground?

If the tree limbs have been deliberately removed, why would someone go to that much trouble; recall the Sentinel Oak.

F. THE WHITE PINE STAND IS POSTED "NO TRESPASSING". WHY MIGHT THE OWNER BE CONCERNED ABOUT PEOPLE IN THE FOREST?

Show students the combustibility of a handful of pine needles.

3. Dead Elm Avenue

Along the lane beside the pine grove are a number of American Elms, 20-40 years old, that have succumbed to the Dutch Elm Disease that has been sweeping the country during the last two decades.

The elm disease agent is a fungus that grows in the outer sapwood of the tree disturbing the vital flow of water and nutrients between the leaves and roots.

The fungus is carried by a small beetle that lays its eggs under the bark. These eggs are contaminated and hatch into burrowing larvae which also carry the fungus. Eventually these larvae change into adult beetles which fly to other trees, thus spreading the disease.

It is almost impossible to stop the beetle from infecting trees. Therefore, research efforts are underway to create a population of disease resistant trees.

Questions To Explore:

A. WHAT EVIDENCE CAN YOU FIND FOR THE CAUSE OF DEATH OF THE ELM?

Have students examine the undersides of slabs of elm bark that have fallen to the ground. Interpret the patterns found on most of the bark slabs.

B. DOES THE AGE OF AN ELM TREE SEEM TO MAKE ANY DIFFERENCE IN TERMS OF ITS GETTING THE DISEASE?

Have students compare the ages of the dead trees based on their relative heights and circumferences.

Examine the grove of young elm trees to the south of the lane; are they dead? Suggest an explanation for what you find.

C. DOES THE DISEASE KILL OTHER KINDS OF NEARBY TREES?

Have students look at other nearby tree types to determine if they are living or dead. (When leaves are not on trees, skin back a piece of bark on a twig. If the inside is green, the tree is living; if the inside is brown, the tree is probably dead.

Relate tree diseases to animal diseases. (Monkeys and people are both primates, but they do not necessarily get the same diseases.)

4. The Ponds

A large marshy area in the Cedar Creek watershed with no outlet to Cedar Creek. Numerous springs drain into the marsh carrying ground water from the surrounding uplands to the low areas via underground routes.

The marsh, originally a sandy-bottomed lake, is in a middle stage of open water to dry land evolution. Over the last few thousand years plant remains have been slowly filling the lake basin. Today the water is very shallow and much evidence of plant succession is visible.

In the deepest water (2-3 feet) communities of cow lilies cover the water surface. Towards the shoreline cattails and water loving shrubs have established a foothold in the muck. As you move nearer to shore, the shrub cover gets larger and changes into dry land types. Rushes, sedges, and wetland grasses are established in open areas.

No trees have yet gained a foothold, but as plant debris continues to fill the basin, eventually the "lake bottom" will be above the water level and will become stable and dry enough to support certain wetland tree types.

A man-made landfill divides the marsh into two areas. The north area is home for a muskrat colony whose lodges are usually visible above the marsh surface.

Questions To Explore:

A. WHAT KINDS OF ANIMAL LIFE MIGHT LIVE IN AND AROUND THIS TYPE OF HABITAT?

Move students to the center of the landfill and have them collect some evidence by:

1. listening (mostly frogs and birds)
2. looking for burrows, lodges, pond bottom nests, runs, holes, etc.
3. looking for mammals, birds, aquatic insects, reptiles, amphibians, and micro life in the water.
4. looking for scats and tracks in the mud around the marsh.

Look for red-winged blackbirds, muskrats, and leopard, bull, or green frogs as the three most easily seen representatives of the bird, mammal, and amphibian groups associated with Michigan marshes.

B. WHY DOES THE MARSH BASIN COLLECT WATER?

Look for evidence of "springs" on the east side of the north marsh area where the land-fill begins.

Does the waterflow seem sufficient to keep up with evaporation.

C. IS THE NORTH MARSH AREA AT THE SAME LEVEL AS THE SOUTH MARSH AREA?

Compare the water levels on either side of the road.

Look for evidence of water flowing across the road; which way did it flow?

D. HOW LONG HAS THE ROAD DIVIDED THE MARSH?

Look at the oldest trees (black willows) growing along the road.

5. Piney Uplands

A mixed stand of planted red and jack pines cover a hillside west of the north marsh. The trees were machine planted as evidenced by furrows still visible on the forest floor.

Red pines are easily recognized by their long stiff needles arranged in bunches of two and the rough, scaly-looking, brown bark on the trunk. Jack pines have short needles that spiral or twist as they grow out from the stem. Their cones are small and spherical when opened. The jack pine tree generally presents an unkempt, knobby appearance.

Red pine is a native Michigan tree although it is not common. Jack pines are associated with forest fires and burned over forest land. The center section of the lower peninsula of Michigan is famous for its jack pine forests.

Questions To Explore:

A. WHAT EVIDENCE IS AVAILABLE TO SHOW THAT THE PINEY UPLANDS IS A PLANTED FOREST?

Have students compare what they see in this pine stand to what they saw in the white pine stand.

Look for the remains of furrows along the tree row.

B. LARGE, BUSHY, BLACK CHERRY TREES ARE FOUND GROWING IN DIFFERENT PARTS OF THE PINE STAND. WERE THEY PLANTED?

Have students age the surrounding conifers; tell them the cherry trees are about five years older.

Relate the "bushiness" of cherry trees to the "bushiness" of surrounding pines.

C. WHY ARE SO MANY OF THE RED PINES BROKEN OVER?

Have students note the direction of the fall, the characteristics of the break, the height of the break above the ground, and the thickness of the broken trunk. Are there any patterns that can be related to wind direction, snow load, or disease.

D. WHAT ARE SOME CHARACTERISTICS OF THE PINE FOREST FLOOR?

Have students measure with their forefinger the depth of the pine needle cover down to the soil surface.

Carefully remove the needles, layer at a time, from a small undisturbed portion of the forest floor. Try to see how many distinctive layers there are in terms of needle deterioration.

Can the needle layers be correlated with seasonal droppings.

Test the forest floor layer at the interface of the pine needles and the soil for PH. Relate the findings to the plant cover in the forest understory.

E. AN UNUSUAL PLANT TYPE IS COMMONLY FOUND ON PINE FOREST FLOORS IN MICHIGAN. CAN YOU FIND IT?

Have students look for small greenish white plants that are usually less than one inch in height growing in small openings in the pine

needles. Some will be shaped like tiny cups and others like upright rods capped with red rounded tops.

These plants are members of a group called lichens. Lichens are really two kinds of plants, a fungus and an alga living together in a mutually beneficial relationship. Lichens are often found growing where nothing else can.

Relate the lichen's unusual life style to the relatively alien conditions that exist on the piney uplands floor.

F. WHY IS A SINGLE LARGE RED PINE TREE DEAD EVEN THOUGH IT IS COMPLETELY SURROUNDED BY OTHER HEALTHY RED PINES?

Have students speculate on factors causing the tree's death. Look for evidence on the trunk and on the ground nearby.

6. Peeper Pond

A small pothole with no outlet, filled with water in the spring and early summer. Each spring the pond is filled with thousands of spring peepers, tiny tree frogs that lay their eggs in the water prior to climbing back up into the trees and shrubs for the summer.

In the spring (April-May) if you stalk the pond silently, approaching from the "Dead Red" pine, the frogs will usually keep singing.

Questions To Explore:

A. IS PEEPER POND A PERMANENT BODY OF WATER?

Have students examine grass at the shoreline. Look at elm trees (now dead); what do they suggest?

How is this pond different from the marsh seen earlier? Do these differences support the permanent water theory or temporary water theory?

B. ARE THE SPRING PEEPERS IN THE POND ADAPTED FOR WATER OR TREES?

If possible, catch a peeper and have students examine his feet and toe tips; make some interpretations.

7. Cedar Creek Bluff Springs

The bluffs along the marsh in the Cedar Creek valley were in part created by the creek as it eroded away the land in its meandering contacts with the valley boundaries.

The sandy valley walls give away at their base to the boggy bottomland composed of plant debris similar to that found in a marsh. Also at the base of the bluff are numerous springs that break out at the water-table represented by the top of the valley floor and flow sluggishly towards the creek.

Questions To Explore:

A. HOW DEEP IS THE BOGGY MATERIAL IN THE VALLEY?

At the springs have students push a long straight stick down as far as it will go. Relate these findings to the story of the valley.

B. WHAT UNUSUAL CONIFEROUS TREE GROWS IN THE BOGGY BOTTOM LAND? A DECIDUOUS EVERGREEN?

Show students a tree with no needles (and no leaves either in winter); look for dropped needles and check tree twigs to show tree is alive, not dead.

8. Hogback Ridge

This is a high humpbacked ridge, over one hundred feet high, with steeply sloped sides. The ridge extends northeast-southwest and lies parallel to Cedar Creek.

The ridge is a relic of the last ice age and represents a glacial deposit that has been steepened on two sides by streams cutting away at its base in times past. It is covered with a mixture of hardwoods including maple, beech, tulip, locust, and aspen.

"Broomstage Lookout" lies just southwest of the highest point on the ridge and is named after the tall brown broomsedge grass growing on the open area.

Questions To Explore:

A. HOW HIGH IS THE RIDGE?

Have students take measurements from "stump point" down into the wooded swamp on the southeast side of the ridge.

B. HOW WAS THE RIDGE FORMED?

Move students to a spot where they can pick up a handful of subsoil; interpret what they see and relate to the gravel pit and story of glaciers.

C. "BROOMSTAGE LOOKOUT" - WHY IS THIS AREA OF BARRY COUNTY SO HILLY?

Have students look southeast across the landscape from "Broomstage Lookout". The hilly topography is the result of the last ice age. This general area of Barry County is the location of a large terminal moraine system that cuts across a portion of southwestern lower Michigan and northern Indiana.

D. IS THIS SECTION OF THE COUNTY GOOD FOR AGRICULTURE?

Have students speculate on local land use, what it has been and what it is now. Students should make decisions on the basis of what they can see from the lookout.

Walk over to the large sugar maple just below the lookout. Tell students this maple is a testamonial to the misuse of the land on Hogback Ridge; have them interpret. Remember the Sentinel Oak.

9. Beech Hollow

This is a large stand of American Beech trees on the Cedar Creek side of Hogback Ridge. Beech prefers rich bottomland or upland soils. It tolerates shade

and gradually dominates the forest growth. Its distinctive smooth gray bark, long pointed buds, and strongly veined leaves are characteristic. The fruit, a triangular nut, is eaten by mammals and birds. The wood is reddish, close-grained, and hard; it is used for furniture, wooden ware, barrel making, and veneer.

Many of these trees are 50-70 years old. An unusual flowering plant can be found growing under some of the beech trees. This plant, known as "beech drops", is a non-chlorophyll producing plant that lives on the roots of the beech trees.

The entire plant is white and grows in small clumps about one foot high.

When beech trees reach the age of many of the trees in the stand, they are usually not cut for lumber; the older beech trees characteristically form hollows in the centers of their trunks.

Questions To Explore

A. THE FOREST FLOOR HAS AN UNUSUAL NUMBER OF HUMP-HOLE FORMATIONS; WHO MADE THEM?

Show students several examples; emphasize the fact that the hump is always beside the hole.

Have students suggest tentative explanations.

Show students a fresh windfall with dirt still around the roots. Relate this to other hump-hole formations.

Age one of the formations with the evidence available.

B. WILL THE PRESENT BEECH FOREST DISAPPEAR OR DOES IT REPRESENT A CLIMAX CONDITION?

Have students look for evidence of tree reproduction in the "hollow". What kinds of young trees are growing in the understory?

The christmas ferns are found in abundance in the beech grove. Relate their presence to climatic conditions suitable for a beech climax condition.

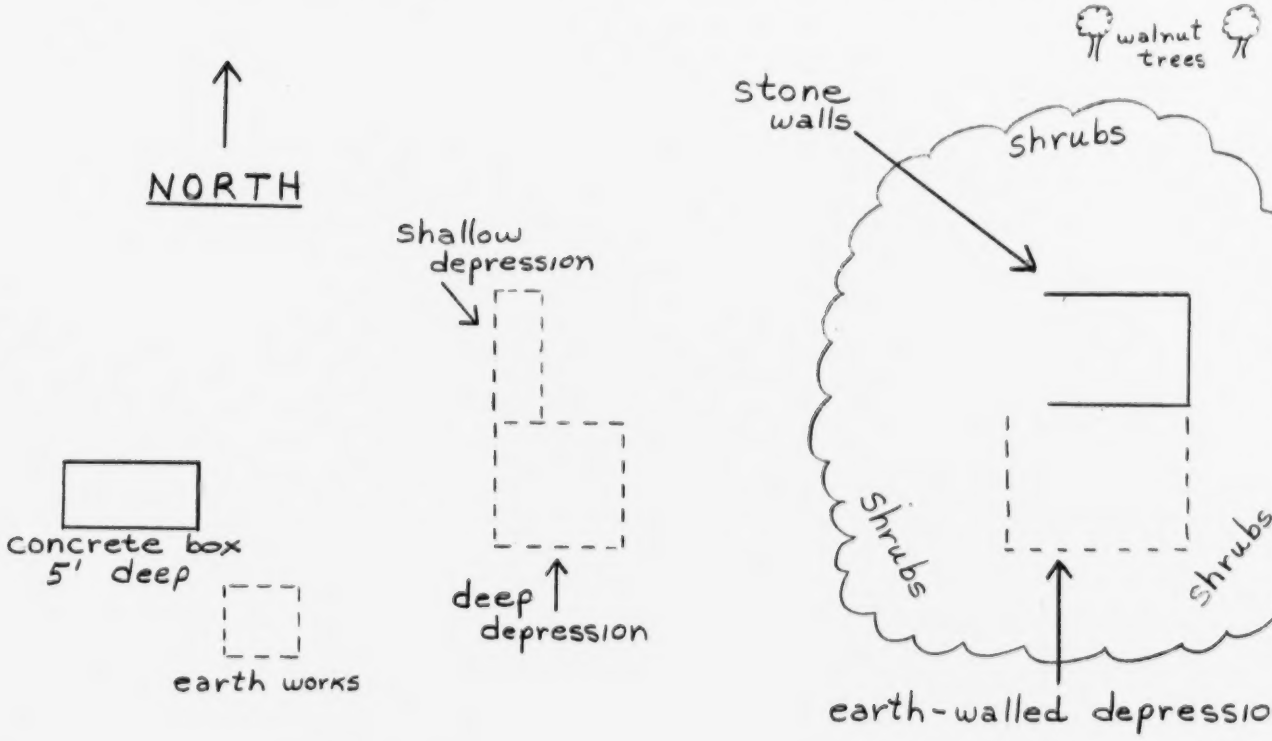
C. WHAT USE HAS MAN RECENTLY MADE OF THE BEECH GROVE?

Have students look for evidence; note any signs of lumbering and new fencing.

10. Abandoned Home Site

Just west of the white pine grove along the north side of the lane are the remains of an old home site. The "ruins" cover an area about 200' long and 100' wide. There are numerous holes and foundation lines. Some concrete and stonework can be seen.

On the east end of the site a large floral escape of lilac shrubs are visible. Several walnut trees and one large eastern red cedar are also on the site.



Questions To Explore:

A. WHAT EVIDENCE IS AVAILABLE TO SUPPORT THE IDEA OF AN ABANDONED HOME SITE?

Have the students search the area for unnatural situations or conditions.

Emphasis should be placed on trees, shrubs, and ground modifications.

Collect as much evidence as possible.

B. APPROXIMATELY HOW LONG AGO WAS THE SITE ABANDONED?

Look for aging clues such as trees growing on foundations, etc.

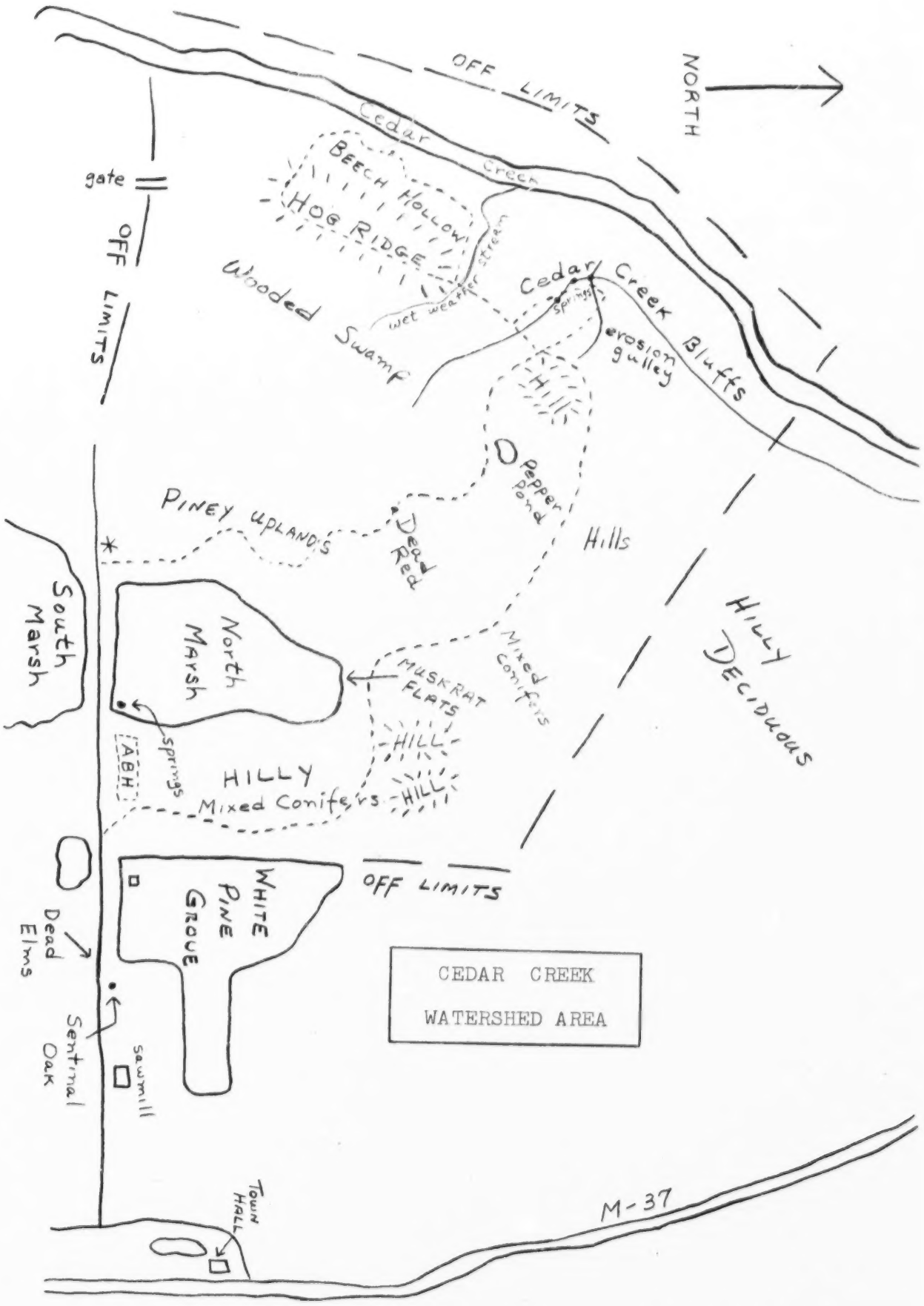
C. WHY WAS THE SITE ABANDONED?

Have the students speculate on various possibilities such as fire, farming, bad land, bad location, disease, etc.

D. WAS THE SITE REALLY A HOME SITE, OR WAS IT SOME OTHER KIND OF SITE?

Have students measure the largest foundations; is it large enough for a house?

What do all the other squares on the ground represent? Are any large enough for a barn? What could the concrete box have been used for?


OFF LIMITS
NORTH
Cedar Creek
gate
OFF LIMITS
BEECH HOLLOW
HOG RIDGE
wet weather stream
Wooded Swamp
Cedar Creek Bluffs
spring
erosion gully
Pepper pond
PINEY UPLANDS
Dead Red
Hills
South Marsh
North Marsh
MUSKRAT FLATS
Mixed Conifers
HILLY DECIDUOUS
springs
ABH
HILLY
Mixed Conifers
HILL
HILL
OFF LIMITS
WHITE PINE GROVE
Dead Elms
Sentinal Oak
sawmill
CEDAR CREEK
WATERSHED AREA
TOWN HALL
M-37

UNDERSTANDING OUR ENVIRONMENT-
THE "GRAND CANYON" OF BARRY COUNTY

A. ACTIVITY RATIONALE

Soil erosion has been and continues to be a major concern of persons working with the land. Farmers, lumberman, highway planners, housing developers, and others who remove the natural vegetation, exposing the soil to the sun, rain, and wind, must consider the consequences of loss of soil fertility, flooding, and erosion.

The "Grand Canyon" activity is designed in part to expose children to a dramatic example of soil erosion, begun naturally, but accelerated by poor land management practices of surrounding landowners.

Students will have first hand experience with sheet erosion on croplands adjacent to the "Canyon" and will observe the effects of gully erosion on the surrounding farmland.

Another consequence of soil erosion children will look at beyond loss of soil and cropland fertility is stream pollution through silting. Children will observe the effects on the "Canyon" stream when there is a rapid runoff of water across exposed soil into the stream.

In addition to observing the effects of poor land management the "Canyon" will also give children some experiences with selected ecological relationships that exist in the small "Canyon" community of plants and animals. It is important that children become aware of some of the delicate relationships that exist in any community of living things. They should recognize that disturbing or changing one factor in one part of the living community can have serious consequences for other parts of the community. Several of these relationships can be easily identified and examined in the "Canyon".

B. RECOMMENDED GRADE LEVEL

This activity is applicable at either the fifth or sixth grade level for students from non-Battle Creek district schools.

C. BACKGROUND INFORMATION FOR TEACHERS

The "Grand Canyon" is a deep, V-shaped, wooded, ravine that cuts deeply into nearly a mile of rolling farmland. A small stream flowing through the gully empties into Cedar Creek.

The "Canyon" is unique because it is the only large erosional feature in the area that is so sharply delineated from the surrounding landscape. The "Canyon's" origins are probably closely related to surface drainage conditions that existed during the melting of the last glacial ice sheet. As the climate became more favorable, plants established themselves in the ravine and slowed the erosion processes.

In comparatively recent times the land was cleared of its protective trees by early settlers. The process of erosion was again accelerated. Within the last 50-60 years second growth timber has again covered the area. Evidence of continued erosion of the gully can be seen, but the process has been slowed.

In addition to its geological history the "Canyon" is also interesting ecologically. The moist warm slopes of the ravine in the early spring are carpeted with wildflowers. At least four species of ferns and a member of another ancient group of plants, the scouring rushes, is present.

The tree types include maples, beech, ironwood, sycamore, elm, and cherry. The oldest trees are 50-70 years old.

The stream and its immediate environs harbor salamanders, frogs, minnows, crayfish, aquatic insects, and numerous other invertebrate life forms associated with small, gravel-bottomed streams.

The wildflowers which grow on the sunny sides of the ravine include trilliums, columbine, spring beauty, violets, hepatica, adderstongue, Dutchmen's Breeches, meadowrues, Soloman's Seal and bloodroot.

The physical features of the ravine create major climatic differences between the top and bottom, thus affecting the types of plants and animals found living together in each of these zones.

D. SEASONAL IMPLICATION FOR THIS ACTIVITY

Students exploring in the "Grand Canyon" in the spring need to be prepared for dampness. The stream is deeper at this time, and boots or old shoes are advisable. In late spring the low vegetation on the shaded slopes often stays wet longer after periods of rain; older clothes are usually advisable for the hiker.

E. DESCRIPTION OF ACTIVITY

INDOOR ORIENTATION

1. The orientation should be brief. Sketch an aerial view of the area showing the drainage pattern and confluence of the "Canyon" with Cedar Creek; indicate forested and farmed areas.

2. Point out the area on a topographic map. Indicate the proximity of the area to the Cedar Creek watershed area.

3. Use a transparency to show valley development. Ask the students to try to determine whether the "Grand Canyon" is young, middle-aged, or mature, in terms of its development.

FIELD STUDY

After departing from the bus, indicate to the students that there will be several interesting areas to observe both on the hike to the "Canyon" as well as in the "Canyon".

Following is a descriptive outline of some key areas to observe and questions to explore.

1. SUMAC GROVE

This is a massive grove of Staghorn Sumac along the lane to the "Canyon". Sumac grows in open fields and roadsides; it spreads by roots. It is recognized by hairy twigs and leaves and bears red fruit when ripe.

Sumac is typically one of the pioneer tree types along with aspen and black cherry to make an appearance in abandoned field succession.

Questions To Explore:

A. WHY DO THE TREES GROW SO COMPACTLY?

Speculate on the trees' spreading by seeds or by roots. What evidence is there?

B. HOW DO YOU RECOGNIZE STAGHORN SUMAC'S POISONOUS COUSIN, SWAMP (POISON) SUMAC?

Compare twigs, berries, and leaves.

C. WILL THE SUMAC GROVE EVENTUALLY COVER THE ENTIRE FIELD?

Evidence for the eventual death of the sumac is visible; have students look for other nearby hardwoods. Develop plant succession story.

2. NUT TREES ALONG LANE TO CANYON

A number of Black Walnut and Shagbark Hickory trees are growing in the fence row on the south side of the lane.

The hickory trees can be recognized by their shaggy gray bark and alternate, compound leaves with 5-7 broad toothed leaflets. The twigs bear large brown buds. The nuts have thick husks, and the meat is edible and sweet.

The Black Walnut is a prized wood. The brown, fine-grained wood is used for furniture, gunsticks, and cabinets. The tree can be recognized by its large fragrant leaves of 15 or more leaflets, each finely toothed and ending in a long point. They are smooth above and hairy below.

The round nut grows in a thick green husk which the pioneers used in making a brown dye. It has a dark, irregular, hard shell that is hard to crack; the meat is edible. A large walnut tree may be worth $1,000 as it stands in the field.

Questions To Explore:

A. HOW ARE WALNUTS AND HICKORY NUTS ALIKE?

If possible, have students collect and examine both kinds of nuts and compare the taste, smell, and morphology.

B. ARE THE NUT TREES REPRODUCING?

Have students look for seedlings. Discuss implications of their findings.

3. FIELD EROSION

A prime example of massive loss of soil from a cultivated field over a large area can be seen at the edge of the "Canyon". A shoulder that is seven feet high with exposed tree roots marks the original level of the land. Persistant agriculture results in a continuing loss of soil each year. The farmer is now farming the subsoil but is able to grow crops through massive applications of fertilizer.

Questions To Explore:

A. WHERE DOES ALL THIS SOIL GO EACH YEAR?

Look at slope of land and trace the probable movement of soil particles during heavy rains.

Relate the erosion here to the landfill in the Mississippi Delta.

B. WHAT MIGHT THE FARMER DO WITH HIS FIELD TO KEEP IT FROM ERODING?

Discuss crop type and planting methods that would slow or stop erosion.

Could the farmer still make money with his land.

4. QUARTZ BOULDER

A quartz boulder estimated to weigh 1500 pounds is lying along the side of the trail where it begins to drop into the "Canyon". This rock has been washed free from the glacial till which comprises the surrounding landscape.

Questions To Explore:

A. IS THE BOULDER IN ITS PRESENT POSITION PROOF THAT EROSION IS STILL OCCURING IN THE UPPER LEVELS OF THE RAVINE?

Have the students look on the downhill side of the boulder; interpret and relate to boulder movement.

Age the boulder movement from available evidence.

5. MICRO-CLIMATES AND THE "GRAND CANYON"

The wind direction and speed, air temperature, and humidity are significantly different at the top of the ravine compared to conditions at the bottom, about 100 feet below.

Questions To Explore:

A. WHAT ARE THE ACTUAL DIFFERENCES IN WIND SPEED AND AIR TEMPERATURE BETWEEN THE TOP AND BOTTOM OF THE CANYON?

Have students measure (with instruments) each and compare.

Discuss the significance to the plant and animal community in the "Canyon".

B. ARE THERE ANY DIFFERENCES IN SOIL TEMPERATURE AND MOISTURE?

Have students measure shaded forest soil on the top and shaded forest soil on the bottom, with respect to temperature and moisture. Discuss the significance of the findings.

6. FOREST FLOOR

The forest floor has a rich variety of herbaceous perennials and ferns. Included are trillium, columbine, spring beauty, violets, hepatica, adderstongue, Dutchman's Breeches, meadowrue, and bloodroot. The ferns include Boston and Maidenhair.

An interesting primitive plant, the scouring rushes (Equisetum) grows in abundance along the trail.

Questions To Explore:

A. WHAT EVIDENCE OF SMALL ANIMAL LIFE CAN YOU FIND AMONG THE LEAVES AND PLANTS ON THE STEEP BANKS OF THE "CANYON"?

Look closely at a small portion of the forest floor on a steep bank.

B. LOOK CLOSELY AT ANOTHER PORTION OF THE FOREST FLOOR ON A STEEP BANK WHERE THERE IS VERY LITTLE COVERING THE SOIL. HOW IS THIS AREA DIFFERENT FROM THE FIRST AREA OBSERVED?

Encourage children to look for evidence of erosion where cover (both living and dead) is scarce. Relate small erosional features to their ultimate impact on the surrounding "Canyon".

7. STREAM IN THE VALLEY FLOOR

The small stream is still actively lowering the valley floor to the level of Cedar Creek into which the "Canyon" stream finally drains.

The stream flow is seasonal. The highest water levels occur in the spring. In the fall the stream slows to a trickle or may dry up. Some of the water carried by the stream seeps out of the ground as springs. The rest of the water comes from a small lake near the head of the "Canyon".

The stream harbors schools of small fish (stream minnows), crayfish, frogs, aquatic insect larva, and a host of small invertebrates living on the bottom.

Questions To Explore:

A. WHAT EVIDENCE CAN YOU FIND FOR THE CUTTING AND ERODING ACTION OF THE STREAM?

Have the children examine a section about 100 feet long. Look for gravel bars, exposed tree roots, and freshly cut or undercut banks.

B. HOW FAST IS THE STREAM DEEPENING THE VALLEY?

Speculate on the kinds of evidence that could be collected to answer this problem.

C. DOES THE STREAM DEEPEN THE VALLEY BY CUTTING STRAIGHT DOWN?

Develop the idea of meandering streams, outer bank cutting, and inner bank deposition. Relate miniature features by the stream to the larger "Canyon".

D. DOES THE STREAM CARRY DIFFERENT AMOUNTS OF WATER AT DIFFERENT TIMES OF THE YEAR?

Find some evidence for this by looking for drift materials caught above the present waterline and by looking for mud and watermarks on trees; also look for erosional deposits.

E. WHAT NATURAL EVENTS ARE OCCURING IN THE CANYON THAT SLOW DOWN THE EROSIONAL FORCE OF THE STREAM?

F. LOOKING AT THIS STREAM IN ITS PRESENT SETTING, UPON WHAT DOES IT DEPEND TO MAINTAIN ITS USEFULNESS AS A HABITAT FOR AQUATIC LIFE?

G. WHAT WOULD BE THE EFFECT ON CEDAR CREEK IF THE "CANYON" WERE LOGGED OVER OR BURNED?

Pick a spot along the stream where you can pour a bucket of water onto the bare soil with the runoff draining into the main current.

Discuss what effect a heavy runoff would have on the stream.

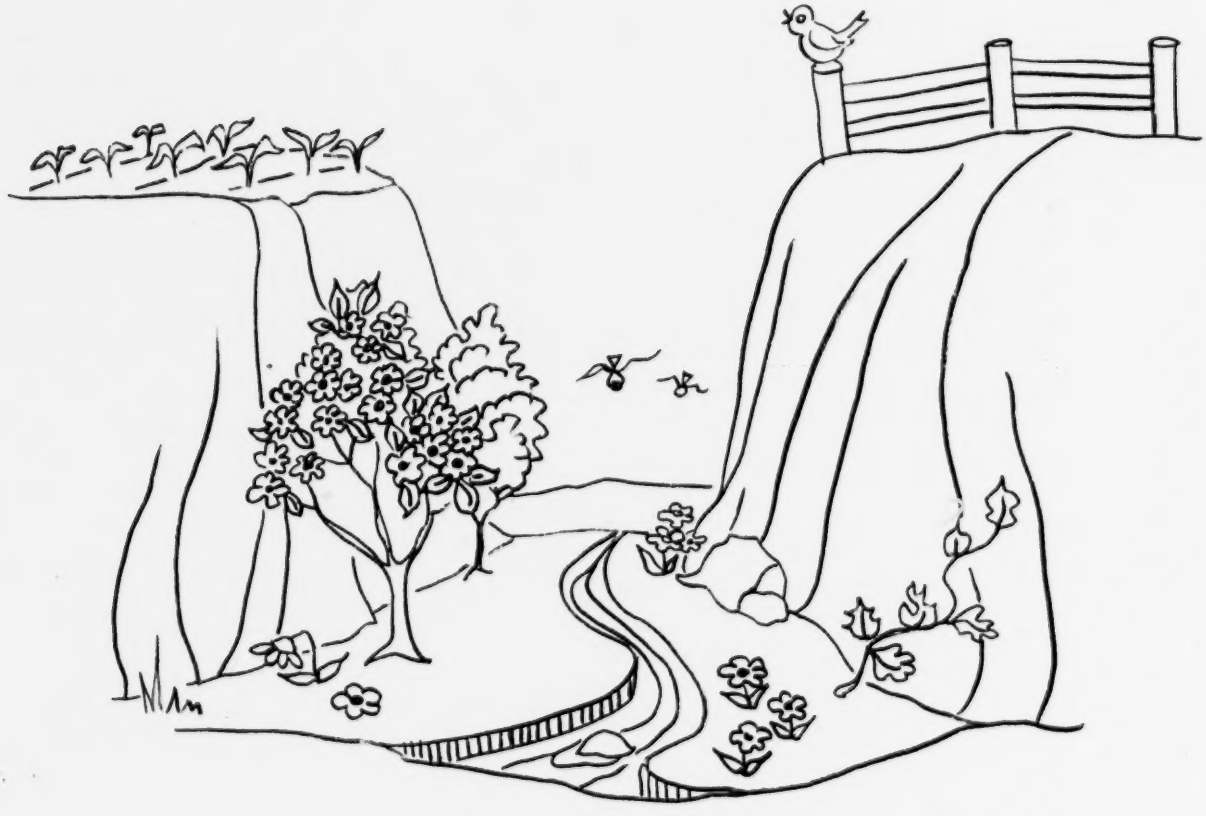
H. DOES THE VALLEY "CHANGE IN AGE" GEOLOGICALLY SPEAKING, AS YOU MOVE UPSTREAM?

Have students look at the general physical character of the valley, concentrating on the change from a broader flat-floored structure to a narrower V-shaped valley.

I. DOES THE "CANYON" PRESENT ANY THREAT TO THE SURROUNDING CROPLAND.

Have students examine the upper reaches of a younger erosion gully at the edge of a field. What evidence is there for danger to that field?

What would the farmer do to prevent the edges of his field from being lost to the "growing canyon?



OBSERVING POND LIFE IN THE SPRING-
PLANKTON AND THE FOOD CHAIN

A. ACTIVITY RATIONALE

Wetlands cover a substantial portion of the state of Michigan and are valuable as waterfowl breeding areas and natural water storage areas. In addition swampy areas provide cover and food for many larger animals including the white-tailed deer. The smaller life forms in marshy and swampy areas are an important part of the food chain that supports animal populations outside the immediate environs of the swamp.

It is important in this age of massive and extreme landfill and drainage projects for children to become aware of the usefulness of these important re. urces in maintaining desirable balances in the natura community.

Examination of a pond in the spring will focus on the zooplankton, copepods, water fleas, algae, midge larvae, worms, and other invertebrates that form the base of the food pyramid. In addition to gaining some insights into the food pyramid base, children will have an opportunity to see evidence for the continuity of life throughout the year in an aquatic environment.

The activity will also focus on the food web that exists in the water and along the shore through first-hand observations of existing plant and animal populations. A food pyramid will be constructed to show the effect of the pond community on animal populations nearby.

B. RECOMMENDED GRADE LEVEL

This activity is applicable at either the fifth or sixth grade level

C. BACKGROUND INFORMATION FOR TEACHERS

Mystery Pond is a quiet body of water so shallow that rooted plants grow entirely across it. The water temperature is fairly uniform from top to bottom and tends to change with the air temperature. There is little wave action, and the bottom is covered with a muck-silt

mixture about two feet deep. The muck is underlain by very hard clay that serves as a barrier to water loss into the sand below.

The swamp basin was originally created by landforms resulting from the Wisconsin Glacial Age which terminated in this area about 13,000 years ago. The number and kinds of plants and animals that make up the swamp community is continuously changing. This swamp started as a sandy-bottomed pond. Seeds of emergent aquatic plants along with zooplankton and phytoplankton spores were carried by the wind, water, or pond visiting animals to begin the plant life in the pond. These plant pioneers established the conditions necessary for small fishes, snails, mussels, caddisflies, mayflies, dragonflies, turtles, frogs, and other small invertebrate forms to make a living.

As the pond weeds became increasingly abundant, they contributed enough decaying matter on the pond bottom each year to begin building up the bottom. In addition many emergent plants began to grow outward from the shore as the water becomes shallower, contributing to the buildup of bottom debris.

Today emergent vegetation including cattails, buttonbush, and cowlilies cover the pond surface. In several spots red maple trees have established themselves in areas where the pond bottom is at the surface. Salamanders, frogs, and turtles are the dominant large invertebrates, Many aquatic insects, worms, crustaceans, and microscopic life forms live in the shallow weedy areas and on or in the muck bottom.

D. SEASONAL IMPLICATIONS FOR THIS ACTIVITY

Spring is an ideal season for exploring around the pond, and the activity can be conducted anytime. Even on rainy or cold days the area is suitable for exploration, considering the close proximity of the pond to the indoor laboratory.

E. DESCRIPTION OF ACTIVITY

INDOOR ORIENTATION

1. What is a pond?

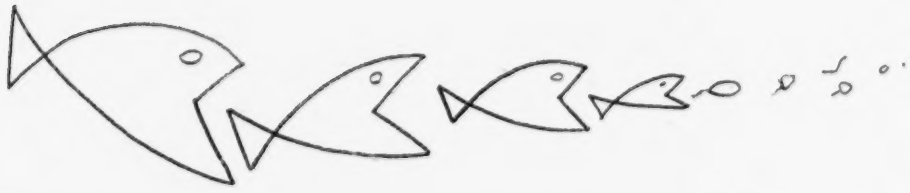
   a. Have children suggest some things they feel might be part of a pond. List their ideas on the board.

   b. Show pictures that will illustrate the major features of a meadow pond. Compare the features in the pictures with the ideas listed previously by the students.

   c. Major pond features shown should include a pond cross-section, submergent and emergent plants, small and large invertebrates, mammals, birds, fish, reptiles, and amphibians.

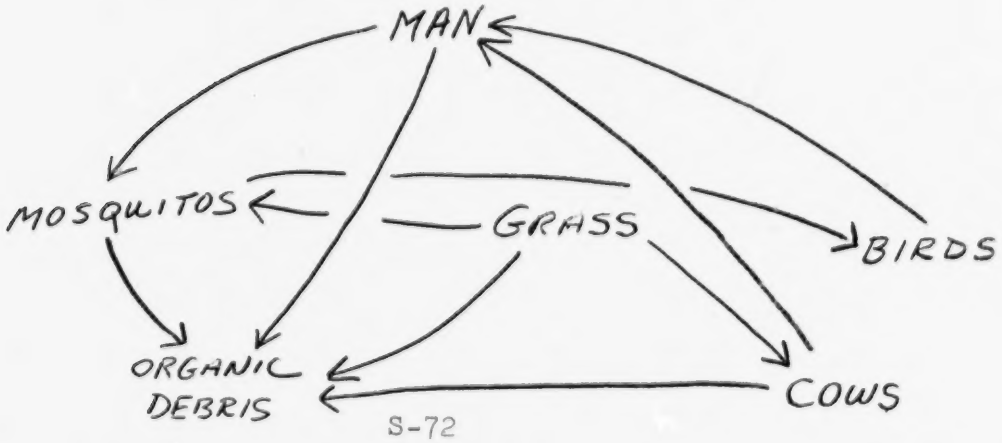
2. Ponds and food webs.

   a. Make a drawing:



   b. Write the phrase food chain on the chalkboard and tell children they are going to explore some food chains in and around a large meadow pond.

   c. Show students a food chain like the one illustrated below:



Ask students to identify the one living thing (in this diagram) upon which all other living things in the chain depend.

d. Tell students similar relationships exist among the plants and animals they have identified in the pond community.

Distribute the two pond food webs charts (see pages S-75 and S-76) to the children.

e. Tell children they are going to explore the pond to find and collect the living things that help support all of the other animals in both food webs. Do not indicate which animals you have in mind.

FIELD STUDY

1. Distribute plankton collecting equipment. This may be a clue for some youngsters.

2. Move the group to the pond margin and ask if anyone knows which kinds of living things are going to be collected. If the group is uncertain, offer the following:

   a. Move the group back 100 feet from the pond edge and tell them the "hunt" begins "here" where a fox might catch and eat a young raccoon.

   b. Move the group to the pond margin and state that young raccoons feed on crayfish.

   c. Focus the group's attention on the pond bottom and state that crayfish feed on small meat-eating insects.

   d. Indicate that small meat-eating insects feed on smaller plant-eating insects.

   e. Indicate that many small plant-eating insects feed on very tiny plankton.

3. Plankton are microscopic plants (and animals) that live in the pond. They form the beginning of the food chain for many animals living in and around the pond.

4. Have students collect a jarful of pond water; discuss

the best method to collect invisible living things.

Tell the students they will use microscopes in the pond lab to observe the specimens they have collected.

5. Students should try to find as many parts of the pond food web as possible while collecting plankton.

IN THE POND LAB

1. Have children make some predictions about the concentration of plankton in their collection bottles. Reasons should be given for predictions.

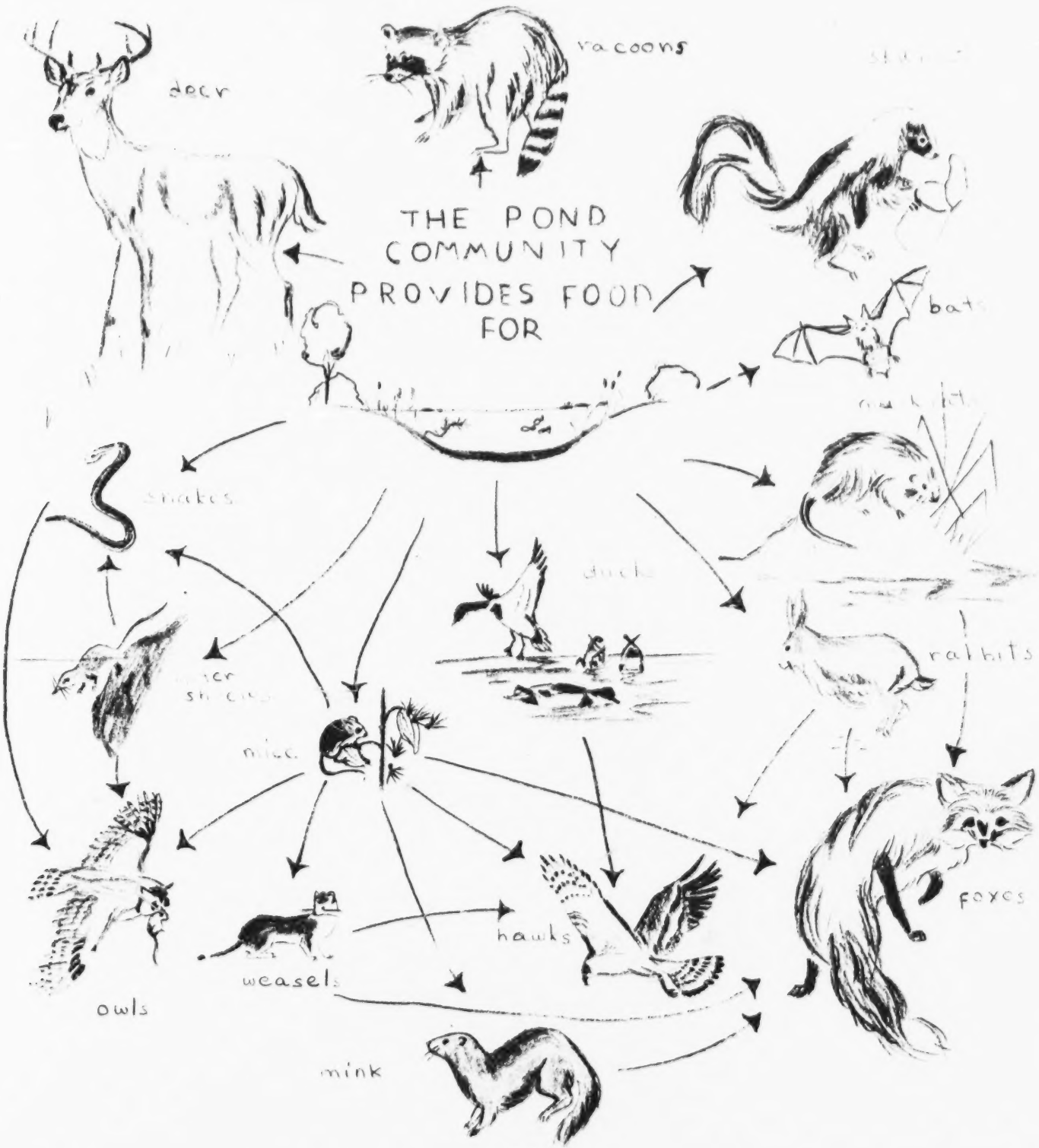
2. Have children refer to the pictures on pp. 32-7, 78-81, and 86-91, Pond Life by Golden Press, which show some common plankton found in the pond.

3. Explain procedures for using microscopes to the students and have them examine their samples.

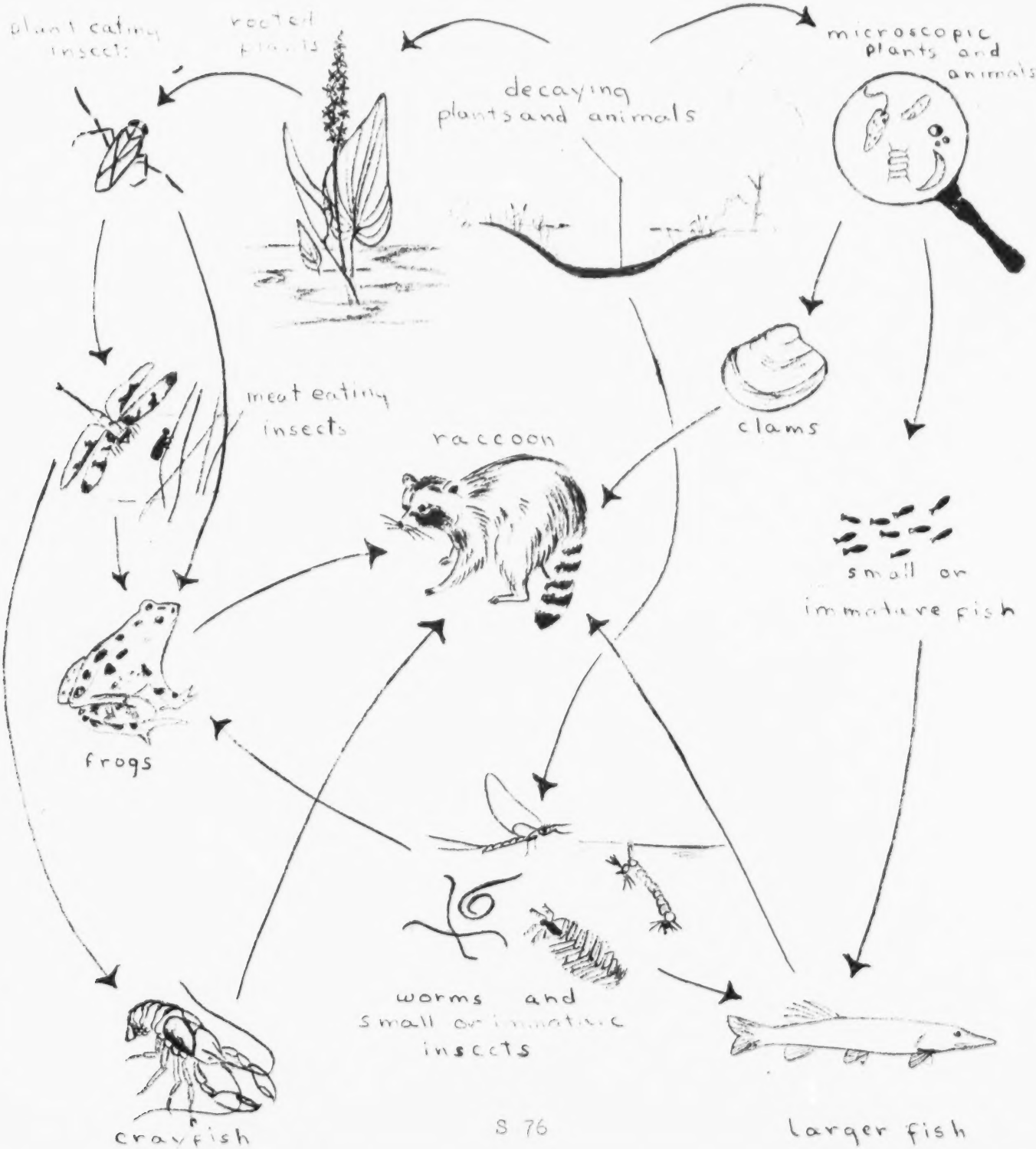
   Encourage children to refer to the pond books to identify the living plankton they find.

4. At the end of the session have the students again look at the pond food web chart to review the importance of plankton in the pond food chain. Relate this web to the larger food environs pond web.

OTHER ANIMALS DEPEND UPON THE FOOD WEB IN THE POND



A RACCOON DEPENDS UPON THE FOOD WEB IN THE POND



Appendix

OUTDOOR EDUCATION CENTER
Battle Creek Public Schools
Dowling, Michigan

REGISTRATION AND HEALTH BLANK
(To be filled in and signed by Parent or Guardian)

Name of Student _____

Address _____ Telephone _____

Name of School _____ Teacher _____

Mother's (first) name _____ Father's _____

In case of emergency, I may be reached at _____
Whose telephone number is _____

Our family physician is _____

****

I make application for my child to attend the Outdoor School program at the Outdoor Education Center at Clear Lake. In an emergency, I hereby give permission to the licensed physician selected by the OEC to hospitalize, secure proper treatment, anesthesia or surgery for my child named on this form.

Date _____ Signature of parent _____

****

1. Underline diseases he has had - measles, mumps, whooping cough, chickenpox, scarlet fever, rheumatic fever, meningitis, infantile paralysis, bronchitis, pneumonia, tonsilitis.

2. Has he any physical disability? If so, what? _____

3. Does he have any allergies? If so, what? _____

4. Does he take medicine? If so, what? _____
(all medications must be given the nurse. Please label.)
Is he under the doctor's care now? _____

5. May we give him aspirin for headache or minor discomfort? Yes ___
No ___

6. When did your child have his last tetanus shot? _____

7. Does he wet the bed at night?____ Does he walk in his sleep?____

8. Please list on the reverse side any recommendations or suggestions which you think might help him while attending the Outdoor School.

BATTLE CREEK PUBLIC SCHOOLS
Battle Creek, Michigan

Division of Instruction

INFORMATION FOR PARENTS - OUTDOOR SCHOOL PROGRAM

Your child will soon have an opportunity to participate in the resident Outdoor School program held at the school-owned Outdoor Education Center. The Outdoor School program is an established part of the elementary school curriculum. The Battle Creek Public Schools have operated the Outdoor Education Center (formerly known as Clear Lake Camp) continuously since 1947 for the purpose of providing resident Outdoor Education experiences for elementary children in grades five and six. Classroom groups in each elementary school attend with their classroom teacher for a period of one school week (9:30 A.M. Monday - 1:30 P.M. Friday). There are two separate experiences. Each fifth grade class attends during the winter season (December, January, February), and each sixth grade class attends during the fall season (September, October, November). Thus, every Battle Creek student has an opportunity to live 10 days at the Outdoor School during the last two years of his elementary school career. This letter attempts to answer some of the questions parents usually ask. Feel free to check with your school about any other questions concerning the Outdoor Schcol program.

WHAT IS OUTDOOR EDUCATION?

Outdoor Education is the use of the out-of-doors to facilitate the total education of children through experiences that cannot be easily conducted in the classroom. Generally speaking, outdoor education is conceived to mean learning "in" and "for" the out-of-doors. Learning "in" the out-of-doors generally implies utilizing the out-of-doors for educational experiences that help us to appreciate, understand, and wisely use our natural environment. Learning "for" the out-of-doors generally implies utilizing the out-of-doors for educational experiences that help us learn to use the natural environment for recreational purposes. One of the significant approaches to Outdoor Education is the five day resident program where teachers and pupils live and learn together in an Outdoor Education Center.

PURPOSE OF THE OUTDOOR SCHOOL PROGRAM:

Outdoor education in the Battle Creek Public Schools is based on the premise that all children should be exposed to the out-of-doors in a school setting to develop an initial awareness leading to a reasonable understanding of man's ultimate dependence upon his natural environment. The Outdoor School program thus becomes an extension of the classroom where teachers and their students use the out-of-doors as a laboratory in which

study and explore in our natural environment. The experience also offers children the chance to develop skills and interests in outdoor recreation which will carry over into later life. The week of residency offers children the opportunity to live democratically with other children and adults as they study, work, and live together.

THE PROGRAM

The fifth grade program focuses on understanding and using our natural environment during the winter season. Each class participates in activities which allow them to study rocks found in Michigan, go on a map and compass hike, study winter pond life, explore in a large forested area, visit a dairy farm operation, and conduct a winter cookout. Other optional activities include an arts and crafts experience, ice fishing, animal tracking, and exploring Clear Lake in winter.

The sixth grade program focuses on understanding and using our natural environment during the fall season. Each class participates in activities which allow them to understand prehistoric life in Michigan as they find and study fossils, visit a bog, study pond life, explore in a forested ravine, visit a beef farm operation, understand boating procedures, and understand gun safety. Other optional activities include archery, an arts and crafts experience, fishing, a cookout, and orienteering with compasses.

LOCATION:

The Outdoor Education Center is located 13 miles north of Battle Creek off Highway M-37 (1 mile south of Dowling).

SUPERVISION PROVIDED

Children are supervised 24 hours a day. In addition to the classroom teacher, there is a permanent Outdoor School staff of:

--a director: The director is similar to a school principal.

--outdoor school teachers: Each classroom teacher is assigned one of these teachers as a resource person.

--a nurse: The nurse is on duty or on call at all times, checks on health and diet problems, administers first aid and all medicines. Each morning a routine inspection is made of beds to check bedwetting. This matter is handled with no embarrassment for the child. Later you will have an opportunity to let the nurse know about any special problems.

QUARTERS

A camp lodge which includes:

1. a dining hall: Meals are prepared by the permanent cooking staff and are served family style. Children set tables, do table cleanup, and act as host and hostesses.

2. meeting rooms: Each class has a room where activities are planned.

3. recreation room: Campfires, games, songs, stories, stunts, etc.

4. trading post: Children may spend 10¢ a day for candy.

5. nature craft shop: Whittling, wood craft, making collages, mounting of leaf, seed, and other collections, etc.

6. cook-out room: Each group usually has a cook-out during the week. Frying pans, mess kits, and other equipment are kept there.

Dormitories: (Boys and girls) Children live in comfortable, winterized dormitories with all the modern conveniences: heat, electricity, showers, drying rooms for wet clothing. Each dormitory sleeps 67 children. (3 wings sleep 20-27 each and 12 counselors.

CLOTHING AND EQUIPMENT:

Your child will bring home a list of suggested clothing and equipment. It is important that the child have warm and comfortable play clothes. Plenty of socks and an extra pair of shoes are necessary in case the child gets damp feet. Please do not send good dress-up clothes. The children do clean up and put on fresh slacks and jeans for their dinner and evening program. However, these clothes should be sportswear.

PHYSICAL EXAMINATION:

It is not a requirement that the child have a physical examination in order to participate in the program. However, this would advise you of any organic defect which your child might have and would guide the Outdoor School staff in planning his activity program. If you are fully aware of your child's physical condition, we do not require an examination.

VISITATION:

Parents are welcome to visit the Outdoor Education Center. However, it seems best for visits to be made either before or after the week's experience preferably on week-ends. Visits made during your child's outdoor school experience often interferes with the routine and causes problems.

THE DAILY SCHEDULE:

7:15 a.m.	Table setters arise
8:00 a.m.	Breakfast
8:45 a.m.	Dormitory cleanup
9:00 a.m. to 11:45 a.m.	Activity period
12:00 noon	Lunch
1:00 p.m. to 5:15 p.m.	Activity period and Lazy hour
5:30 p.m.	Supper
6:15 p.m.	Evening program
7:15 p.m.	Evening recreation: campfire, songs, games, stories
8:15 p.m.	Wash-up, showers
8:45 p.m.	Lights out and story
9:30 p.m.	Quiet

3770

OUTDOOR EDUCATION CENTER
Battle Creek Public Schools

Equipment and Clothing Suggestions for the Outdoor School Activities at Clear Lake

This is only a list of suggestions. No new clothing is necessary for the Outdoor School. Old warm play clothes are best.

IMPORTANT: Mark child's name on each piece.

RAINY DAY CLOTHING: It is essential that each child be prepared for rainy days at Clear Lake. Many of the outdoor school's activities are out-of-doors in damp weather. We suggest:

- rain coat
- waterproof head covering
- rubbers or boots

COLD WEATHER CLOTHING: It is essential that each child bring adequate clothing for cold days. We suggest:

- heavy jacket
- warm hat
- gloves (at least two pair)
- boots

PLAY AND WORK CLOTHING: Outdoor school activities require sturdy clothing such as:

- warm slacks or jeans
- shoes (2 pair)
- underwear, socks
- sweater, warm jacket
- cotton shirts, T-shirts or blouses
- kleenex or handkerchiefs

NIGHT CLOTHING AND TOILET ARTICLES:

- pajamas
- 2 sheets and pillow case
- 2 warm blankets or sleeping bag
- towels and wash cloths
- toothbrush and toothpaste
- soap and soap box
- comb, hair brush

THE FOLLOWING ARE VERY USEFUL AT CLEAR LAKE (if child already owns them):

- writing materials
- camera
- compass
- jack-knife - pocket type (no child has need for a large hunting sheath knife)

SPENDING MONEY:

The camp operates a small Trading Post where the students may purchase candy, stamps, postcards, film, etc. All money ($1.50 should be sufficient) is deposited in each student's account and the unused portion is returned to the student on Friday.

OUTDOOR EDUCATION CENTER
Battle Creek Public Schools

WHAT-TO-TAKE CHECK LIST

This list will help you remember what to take to the Outdoor School and what to bring back home. Use the first column to check off your belongings as you pack them at home. Use the other column to check these articles when you leave the Outdoor School.

____	rain coat and hat	____
____	rubbers or boots	____
____	hat	____
____	gloves	____
____	jackets	____
____	slacks or jeans	____
____	shoes	____
____	underwear	____
____	socks	____
____	sweater	____
____	shirts	____
____	T-shirts	____
____	kleenex or handkerchiefs	____
____	pajamas	____
____	sheets and pillow case	____
____	blankets or sleeping bag	____
____	towels and wash cloths	____
____	toothbrush and toothpaste	____
____	soap and soapbox	____
____	comb, hairbrush	____
____	writing materials	____
____	camera	____
____	jack-knife	____

EC770

OUTDOOR EDUCATION CENTER
Battle Creek Public Schools
Dowling, Michigan

Dear Parent:

I am happy that most of the children in your child's room are going to participate in the Outdoor School program next week here at the Outdoor Education Center at Clear Lake. We are sending this note with last minute instructions which I hope will clear up any questions you may yet have.

Your child will be very happy to hear from you while he is here. The address is Outdoor Education Center, Dowling, Michigan, 49050. In case of an emergency, which would make it necessary to call your child while he is here, the phone number is 721-8161.

We suggest that your child put as many odds and ends as possible into his blanket roll. This will eliminate the need for more than one suitcase for clothing. Be sure the blanket roll is tied securely and has a name tag on it.

The busses will be at the school between 8:30 and 8:45 Monday morning to take the children and their luggage. Your child will have been told by his teacher where the luggage is to be placed for loading on to the bus.

PLANS FOR RETURN: The busses are scheduled to depart from Clear Lake at 1:30 P.M. and should arrive at the school between 2:00 and 2:15 Friday afternoon. If parents are at the school to meet the children, they and their luggage may be picked up as soon as they arrive at school. If it is impossible for your child to be met, or to go home on his arrival, he may go into the building and stay until the regular dismissal time at 3:15 P.M.

PLEASE we would appreciate it if the children do not plan to call you on their arrival back to school as it is important that they do not tie up the only phone at the school.

REMINDER

Be sure to mark your child's name on all clothing and possessions.

Sincerely,

Jack N. Wykoff,
Director

EC770

Battle Creek Public Schools
Battle Creek, Michigan

OUTDOOR EDUCATION CENTER

Outdoor School - Teacher Planning Sheet - Fall

Classroom teacher_____ School _____

Grade Level _____ Assigned OEC Teacher _____

LISTED BELOW ARE THE RECOMMENDED ACTIVITIES THAT YOUR CLASS WILL PURSUE WHILE ATTENDING THE OUTDOOR SCHOOL:

1. Boating
2. Gun Safety and Introductory Marksmanship
3. Prehistoric Life In Michigan - A Fossil Dig In Barry County
4. Understanding Our Environment - A Visit To A Sphagnum Bog
5. Observing Pond Life In The Fall - The Food Chain
6. Understanding Our Environment - The "Grand Canyon" Of Barry County
7. Visit To A Beef Farm

LISTED BELOW ARE THE OPTIONAL ACTIVITIES THAT ARE AVAILABLE. YOUR CLASS WILL BE ABLE TO PARTICIPATE IN TWO OF THESE ACTIVITIES. PLEASE CIRCLE YOUR TWO CHOICES.

1. Archery
2. Arts and Crafts Using Native Materials
3. Cooking Out
4. Fishing In Clear Lake
5. Orienteering On A Compass Course

PLEASE COMMENT BELOW ON ANY SPECIAL MATERIALS YOU OR YOUR CHILDREN HAVE DEVELOPED FOR USE WHILE AT CLEAR LAKE (LOGBOOKS, NOTEBOOKS, DIARIES, CHARTS, FLAGS, ETC.); DO YOU HAVE A SPECIAL THEME FOR THE WEEK?

_____

_____

_____

_____

Battle Creek Public Schools
Battle Creek, Michigan

OUTDOOR EDUCATION CENTER

Outdoor School - Teacher Planning Sheet - Winter

Classroom teacher _____ School _____

Grade Level _____ Assigned OEC Teacher _____

LISTED BELOW ARE THE RECOMMENDED ACTIVITIES THAT YOUR CLASS WILL PURSUE WHILE ATTENDING THE OUTDOOR SCHOOL:

1. Cooking Out
2. Discovering Michigan Rocks
3. Drop-off Hike
4. Winter Pond Life - "Probing For Plankton"
5. Understanding Our Environment - Exploring in the Cedar Creek Watershed.
6. Visit To A Dairy Farm

LISTED BELOW ARE THE OPTIONAL ACTIVITIES THAT ARE AVAILABLE. YOUR CLASS WILL BE ABLE TO PARTICIPATE IN TWO OF THESE ACTIVITIES. PLEASE CIRCLE YOUR TWO CHOICES.

1. Arts and Crafts Using Native Materials
2. Ice Fishing On Clear Lake
3. Animal Tracking In Winter
4. Winter Lake Exploration

PLEASE COMMENT BELOW ON ANY SPECIAL MATERIALS YOU OR YOUR CHILDREN HAVE DEVELOPED FOR USE WHILE AT CLEAR LAKE (LOGBOOKS, NOTEBOOKS, DIARIES, CHARTS, FLAGS, ETC.); DO YOU HAVE A SPECIAL THEME FOR THE WEEK?

_____

_____

_____

_____

Battle Creek Public Schools
Battle Creek, Michigan

OUTDOOR EDUCATION CENTER

Outdoor School - Teacher Planning Sheet - Spring

Classroom teacher _____ School _____

Grade Level _____ Assigned OEC Teacher _____

LIST BELOW THE EIGHT MAJOR ACTIVITIES THAT YOUR CLASS WISHES TO PURSUE AT THE OUTDOOR SCHOOL:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

LIST BELOW ANY OTHER EXPERIENCES THAT YOU HOPE YOUR CHILDREN WILL BE EXPOSED TO WHILE AT CLEAR LAKE:

1. _____
2. _____
3. _____
4. _____

PLEASE COMMENT BELOW ON ANY SPECIAL MATERIALS YOU OR YOUR CHILDREN HAVE DEVELOPED FOR USE WHILE AT CLEAR LAKE (LOGBOOKS, NOTEBOOKS, DIARIES, CHARTS, FLAGS, ETC.); DO YOU HAVE A SPECIAL THEME FOR THE WEEK?

_____

_____

_____

_____

PLEASE COMMENT BRIEFLY ON THE BACKGROUND PREPARATION YOUR CHILDREN HAVE HAD PRIOR TO THEIR VISIT TO CLEAR LAKE:

LIST BELOW ANY ADDITIONAL COMMENTS OR SUGGESTIONS YOU WISH TO MAKE TO YOUR OUTDOOR SCHOOL TEACHER:

WHAT IS YOUR CURRENT CLASS ENROLLMENT? _____

SEND THIS SHEET TO THE OUTDOOR EDUCATION CENTER AT LEAST FIVE DAYS BEFORE YOUR SCHEDULED VISIT OR GIVE IT TO YOUR PRINCIPAL WHO WILL FORWARD IT IN ADVANCE OF YOUR WEEK'S VISIT.

CLASS ENROLLMENT SHEET

Outdoor Education Center
Battle Creek Public Schools
Phone: 721-8161

Teachers: Please complete this list in alphabetical order and and bring it with you on Monday when you come to the Outdoor School. It should be turned in to the nurse upon arrival.

Phone numbers: This list will be kept available in the office in case you or the nurse wish to contact the child's home.

School _____ Teacher _____

BOYS	PHONE	GIRLS	PHONE